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SECOND PRIZE ESSAY.

(HONOURABLY MENTIONED.)

Subject :—

"WHAT SHOULD BE THE DISPOSITION OF THE MATÉRIEL AND PERSONNEL OF THE BRITISH NAVY IN TIME OF PEACE, AND HOW CAN THE PEACE STRENGTH BE MOST RAPIDLY EXPANDED TO WAR STRENGTH?"

By Commander HARRY JONES, R.N.

"*Carpe Diem.*"

INTRODUCTION.

FOR nearly one hundred years the British Navy has not been put to the test of a serious war, and its supremacy on the open sea has been practically unchallenged in battle since Trafalgar, consequently its growth and development, during the last century, have been under peace conditions. As to the future of naval warfare there is room for much speculation, and opinions as to its course must needs be very diverse. Although many useful lessons may be learnt from the small naval wars which have taken place since the introduction of steam and iron ship-building, it must always be born in mind that the ships engaged have not been, generally speaking, of the best types, and that in most cases the combatants were very unequally matched.

When we consider how little is really known as to the conditions of sea-fighting with modern weapons, it would seem that on one point only can there be any real certainty, viz., that the outbreak of a serious naval war would be prolific in unforeseen events, the result of which may, and

let us hope will, be favourable to us, but which on the other hand may be very much the reverse. In former great wars England has, generally speaking, begun badly, but, by dogged endurance, ended well. Let us then, while hoping for good, expect evil fortune at the commencement of our next naval war, and thus be best armed against it.

It is now generally accepted as an axiom by political authorities, that our naval strength should be at least equal to that of the two next strongest naval Powers. I would add to this, that we should prepare in peace-time the necessary administrative machinery to augment the Navy when war breaks out to the utmost limit which the resources of the Empire can support. The system of conscription on the Continent is based on the principle that in a great war the whole resources of a country will be required and made use of. Hence, in those countries which primarily depend on their land forces for defence the system of universal military service has been adopted. The security of the British Empire depends primarily upon sea-power, and in a very minor degree upon purely military strength. In consequence we are able to dispense with universal military service, but, on the other hand, we must be prepared in war to make *any* sacrifice for efficient naval defence, without which we should inevitably be starved into submission.

I would advocate that we ought to provide for the possible contingency of reverses in the early stages of a naval war, and that the Government should be armed in peace with powers to command all the resources of the Empire to aid the Navy to retrieve such initial reverses. Legislation in peace-time should give the Admiralty the power to command in war the services of all ships in the Merchant Navy which they may require; to confiscate all ships under construction and to monopolise all shipbuilding and ordnance plant necessary for naval purposes, and everything so taken to be paid for at a fair price fixed by the Government. As regards *personnel*, we cannot in these days revert to the methods of the press-gang, nor would it be advisable to do so if we could. Any form of conscription to be effective would have to be enforced in peace, and would be both costly in the Estimates, and, by withdrawing men from their peaceful occupations, wasteful of the productive labour of the country. The numbers required for naval service are, however, small as compared with those for military purposes, and we have had during the past two years such splendid proof of the loyalty of the Empire in providing volunteers for the Army, that there is no reason to doubt that we shall be able to get as many able-bodied, but untrained, men as we may require after war has been declared by us, or against us. Untrained they may be, but if we are called upon to meet the great losses and increased requirements entailed by prolonged war, I would argue that we must design during peace the machinery for rapidly

training and equipping in war such raw material as I have indicated, to fill not only the gaps in the fighting line, but to augment the fighting *personnel* to the very large numbers which may possibly be required.

Details I leave to a later stage to discuss, but what I now wish to advocate is this: that ample powers should be provided in peace for making use of the full effective strength of the Empire in war. Ships, dockyards, building yards, arsenals, and stores—*all* should be placed at the absolute disposal of the executive authorities, to deal with as they see fit when the need arises. Our strength lies not only in the numbers of the active list of ships and men; there is a grand reserve behind in the great manufacturing centres of the country for *matériel*, and in every part of the Empire we can find strong and willing volunteers to augment the *personnel;* but unless our plans are well made in peace, it will be difficult to make use of either to the best advantage when war arrives.

These preliminary remarks finished, we have now to consider the subject of the essay, and in doing this I propose to adopt the following plan. The different items of *matériel* and *personnel* will be taken separately, and their disposition in peace having been first considered, the question of expansion to war strength will be dealt with before going on to the next.

The disposition of our fleet in time of war will depend primarily on the question of who are to be our enemies. It is obviously impossible to discuss all cases in a short essay, so I take here the case of a stray European coalition against England, and leave altogether out of consideration the question of war with the United States, Japan, or other Powers.

Battle-ships.

Full command of the sea can only be gained by the main fleets of battle-ships, which should be organised in peace and war alike, with a view to decisive combined action. Decisive results can only be gained by concentration of force, and, consequently, any dispersion of strength by sending battle-ships to distant stations should if possible be avoided. Considerations of coal supply will in these days practically confine the action of great fleets to European waters in all but exceptional cases. The political state of affairs existing in China at the present time *is* such an exceptional case, which has caused the principal naval Powers to detach battle-ships from their European fleets in times of peace. Should war break out under present conditions these detachments would balance each other, and the comparative strength, the main fleets, would remain unaffected. Our fully commissioned battle-ships in European waters are now distributed amongst the Mediterranean, Channel, and Reserve Squadrons.

The numerical strength of the Mediterranean and Channel Fleets that it is necessary to maintain should, I think, depend on the state of preparedness of our most probable enemies, and should not be allowed to fall below what will give us reasonable expectation of victory over any probable combination which could rapidly be effected against us in Mediterranean waters. Taking Russia and France as the most probable combination, I should have our Mediterranean and Channel Fleets kept at such numerical strength that we may have something more than a reasonable prospect of success against a combination of their Black Sea and Mediterranean Fleets. In the present circumstances, as far as *battle-ships* are concerned, this condition may be regarded as fairly fulfilled, but any increase of force by our rivals or transference of power from the Baltic or Channel to the Mediterranean in time of peace should be immediately provided for by corresponding increase in our Channel or Mediterranean Fleets.

It is extremely probable that the Channel or Mediterranean Fleets would be required to combine in war into one command; in peace-time, however, it is more convenient they should be divided as at present.

The battle-ships of the Channel Fleet are now kept more or less permanently in commission, officers and men being partly changed at stated intervals; in the Mediterranean, on the other hand, it is usual for ships after serving a 3 years' commission to be paid off, and recommission with an entirely new crew at Malta. I think in this matter the practice in the Channel is superior, and I should like to see a new system started somewhat on the following lines: Every battle-ship on commissioning to serve 18 months in the Mediterranean, then 18 months in the Channel; then, after a thorough refit in a home dockyard again to go to the Mediterranean, and so on until the time arrives for her to pass out of the first line and join the Reserve Fleet, which she should not do until very thoroughly overhauled and refitted in every particular. My reasons for this are as follows:—

1. The constant interchange of ships would lead to uniformity of administration and methods in the two fleets, improvements started in one would more quickly be adopted in both, and consequently the two fleets could act more effectively if combined in war.
2. The process of recommissioning as now carried out at Malta does not, I think, contribute to either efficiency or economy, and usually results in the Mediterranean Fleet going one ship short for 3 or 4 months. After 3 years' service much has to be done in the way of alterations and improvements of armament and machinery, all internal parts of the ship most be scraped and painted, chain cables tested, etc.—all

these details can be carried out more rapidly, efficiently, and economically in a home dockyard than in Malta, which would be quite sufficiently taxed in making good the ordinary defects of the very largely increased numbers of ships now kept in commission in the Mediterranean. I would also refer to the bad effect on the new crew entailed by a long spell of dockyard work at the beginning of their commission.

3. As is well known, the efficiency of a newly-commissioned ship is by no means equal to the standard attained a year later. By keeping the ships always in commission and changing only a part of the officers and ship's company at a time, a higher general level would, I think, be constantly maintained, though this might possibly be somewhat lower than the standard attained by the best Mediterranean ships in their second or third year of commission under present conditions.

Our numerical strength of commissioned battle-ships in peace-time is at present at follows :—

	First-class.	Second-class.	Third-class.
Mediterranean Fleet	10	—	—
Channel	8	—	—
Reserve	1	8	1
China	3	2	1
	22	10	2

One third-class battle-ship and four harbour defence-ships act as guard-ships at Gibraltar, Alexandria, Bombay, Simonstown, and Bermuda, and though these would greatly paralyse hostile cruiser action at these important points, they cannot be considered as a part of the battle-ship force properly so-called, which consists solely of ships intended for combined fleet action. For expansion to war strength on the declaration of war and for future reinforcements the following are our available resources :—16 first-class battle-ships building in various stages of completion, which, under the pressure of war needs, could undoubtedly be pressed forward very much more rapidly than under peace conditions, provided expense be not spared, and details, not essential to sea-going and fighting qualities, be omitted. In the Fleet and Dockyard Reserves at home and abroad are : 1 second-class battle ship, 8 third-class battle-ships, and 13 ships classified in "Brassey's Naval Annual," 1901, as coast-guard and harbour defence-ships. In addition to these are some few broadside ironclads of early date, now classed as non-effective, which might in a protracted war be re-armed and made use of in the later

stages when the combatants become exhausted by losses of better ships. There may also be some ships completing for foreign Governments in private yards which could be seized, and made use of.

For the first needs of war we should, I think, be able to commission in a short space of time, 10 first-class and 8 second or third-class ships as a reinforcement. These ships should, I consider, in the first instance join the Reserve Fleet.

I would not advocate an immediate reinforcement of the Channel or Mediterranean Fleets with battle-ships, as I think the efficiency of those fleets might be possibly impaired by the introduction of new and undrilled ships at the last moment; but when losses occur, as they inevitably must, the best of the newly commissioned first-class ships could be passed on from the Reserve Fleet to fill the gaps in the Mediterranean and the Channel. The 18 first-class battle-ships of the combined Mediterranean and Channel Fleets will have great advantages over a combination of a hastily assembled allies, even if these have considerable numerical superiority. I do not propose any reinforcement of the China battle-ships, as the issues of the fighting in those waters will not be vitally important to the safety of the Empire. The fleets on this station must, of course, fight it out with our enemies there, but even should we be decidedly unsuccessful our enemies will also be considerably damaged, and, therefore, unable to follow up their advantage without assistance from their European Fleets, assistance which it is not probable they will be in a position to afford, except by dangerously reducing their strength in that more important strategical quarter.

The question of supremacy of the battle fleets must without doubt be fought out in Europe, and should the first encounters be indecisive and both sides be compelled by severe losses to withdraw to their ports, command of the sea will fall to the Power which can soonest again put to sea with a fleet capable of withstanding cruiser attack. For such a purpose many of the older battle-ships are fairly adapted, many of them are well protected with armour, and it should be quite possible to remove their old muzzle-loading guns and mount some breech-loaders taken from disabled ships or elsewhere. I do not advocate that these ships be re-armed and refitted in peace—the money could probably be much better spent on new constructions—on the outbreak of war, too, our dockyards and arsenals would be fully occupied in equipping newer and better ships; but *after* serious battles have taken place, and both sides have lost heavily in battle-ship strength, it is conceivable that these obsolete armoured vessels might be invaluable to us.

To sum up what should, I think, be our policy in regard to battle-ships—the Channel and Mediterranean ships to be treated as a combined

fleet upon which the first shock of war will most probably fall, and consequently kept at such a state of efficiency in numbers and organisation as to give us at least a reasonable possibility of initial success.

The Reserve Fleet to be regarded as a nucleus for large reinforcement during war, and to be charged with the duty of striking at any hostile fleet in the Channel or British waters. Losses in the Mediterranean and Channel Fleets to be made good from the Reserve Squadron. All battle-ships building in England, whether for our own or foreign Navies, to be completed in all fighting essentials with the utmost speed, and sent to reinforce the Reserve Fleet as soon as possible. The best of the second and third-class battle-ships to be also commissioned to reinforce the Reserve Fleet. All remaining armoured ships to be left alone until after the issue of the first encounters of the battle fleets, but *then* if the results be indecisive or against us, re-armed and equipped with all speed and efficiency possible.

Cruisers.

The peace distribution of cruisers, according to the Navy List, May, 1901, is as follows (N.B.—Ships temporarily attached to the China command are shown as serving with that fleet, but ships detached for service on the Cape station are shown as being with their original fleets):—

	First-class.	Second-class.	Third-class.[1]
Mediterranean	2	4	4
Channel	2	2	2
China	6	7	1
North America	1	3	3
S. E. Coast	—	2	0
Cape	1	2	4
E. Indies	—	1	4
Pacific	1	2	0
Australia	1	0	7
Cruiser Squadron	1	3	0
Reserve	2	2	—
Total in Commission	17	28	25
Totals completed and building, Dec. 1900	37	60	44
Available to reinforce	20	32	19

[1] In all cases the Navy List classification has been adopted.

The distribution detached above, with the exception of the ships in the Mediterranean, Channel, Reserve, Cruiser, and China Squadrons, represents the normal state of requirements for protection of British interests in times of peace, police duties in fact. In the event of a great war these requirements would give way to the greater need, and a redistribution would be called for. The cruisers shown with the

Mediterranean are partly employed on similar duties, and partly for the purposes of peace training in fleet work. The Channel Reserve and Cruiser Squadron ships may be regarded as entirely occupied in peace training.

The condition of affairs in China is at present a condition of preparation for war, not peace, and the squadron has been increased accordingly. Should war break out before the normal state of affairs is resumed, it is probable that the China fleet would be immediately assembled for action against our enemy's ships in those waters, if this had not already been done beforehand. On the result of such action the necessity for further reinforcements or otherwise would depend.

I do not propose to enter into any discussion as to the above *peace* distribution of cruisers, as I consider it would be futile and presumptuous for anyone to attempt to weigh the relative requirements of different stations without much fuller information than is open to any private individual, and will therefore go on to consider the question of expansion to war strength. Working on the assumption already made, that we are to prepare for a war which will tax our resources to the utmost limit, I propose first to consider the needs of the battle fleets for a sufficient proportion of cruisers for scouting duties; and secondly, the necessities of adequate protection for the trade routes, and coaling stations.

To attempt to be in force at all points will surely lead to such a frittering away of strength, that while decisive actions will certainly be delayed, we shall lose much by weak detachments being overwhelmed.

The first need of all I regard as that of the battle fleets for a full and sufficient number of cruisers to enable them to find the enemy's fleets, and to bring them to action; to decide *what* is a full and sufficient number is a difficult matter, for the only experience on which we have to draw is that of naval manœuvres under peace conditions. The numbers in 1899 manœuvres were 19 cruisers with one fleet, and 20 with the other. In 1900 the numbers were 18 and 15. I do not think in either case the numbers were found to be excessive. Wireless telegraphy, by increasing the distance of communication, has added to the scouting powers of the cruisers, and reduced the number which would be required if it were not in existence. The number necessary in no way depends on the number of ships in the line of battle, a fleet of a small number of battleships requiring the same number of cruisers to obtain information for it as a large one. But a fleet acting in narrow waters requires a smaller number than a fleet in open waters, *e.g.*, a fleet stationed a short distance from its own coast can in practice disregard one semicircle completely, throwing all its scouts out in the direction of the enemy's coast.

The distance of the enemy's base must also be considered.

In considering the relative needs of the three principal fleets, it would appear that of the Mediterranean is the greatest, as this fleet will most probably be acting at no considerable distance from the enemy's base and away from any length of friendly shore. Next in importance I would place the need of the Channel Fleet, especially if it is given an independent mission, such as an advance up the Baltic. The Reserve Fleet which will probably be stationed at Portland, and have its objects across the Channel, will not require such large numbers.

Allowances must of course be made for cruisers detained for coaling and temporary repairs. Having weighed the foregoing considerations, I submit the following as my suggestion of the numbers necessary. Mediterranean: 6 first-class, 9 second-class, 9 third-class. Channel: 4 first-class, 7 second-class, and 7 third-class. Reserve: 3 first-class, 5 second-class, and 4 third-class. If the Channel and Mediterranean Fleets combine, the numbers might be slightly reduced, while the combination continued. After providing for the needs of the battle fleets, our next most important consideration should be to keep open the route to India by the Canal; my reason for this statement is as follows:—

In such a grave state of affairs as we are considering, viz., a great war with a European combination against us, we shall almost certainly at the same time be engaged in a land conflict on the Indian frontier, and it will be absolutely essential that we should keep open our line of communications to Bombay. I am altogether opposed to the policy of withdrawing from the Mediterranean, and using the Cape route to India only, and for the following reasons: With our battle fleets in such an efficient state of strength and preparedness as they are now, I consider it would be entirely to our advantage to force an early and decisive fleet action; on the other hand, our enemy may adopt the policy of keeping his battle fleets at home to await a weakening of our forces by torpedo or submarine attack; I consider that by holding the route to the East through the Mediterranean, though it will undoubtedly be much open to attack, an inducement will be offered to draw the Toulon or other fleets from their ports, and so give us the opportunity we desire. Although at first sight it may appear that the Canal route to India would be much more dangerous than the Cape route, there are, I think, some very weighty reasons for adopting it, apart from the very important advantages of gaining time and possibly drawing out the enemy's fleet. The length of the line of communications being so very much less makes the problem of defence easier of solution. If the Canal and Aden be securely held, the Red Sea can be regarded as safe against attack, and the route from Aden to Bombay should be comparatively so, because of its great distance from any possibly hostile base.

From England to Gibraltar both routes are practically equally liable to attack; there remains then the question whether it be easier to defend the line of communications from Gibraltar to Port Said or the very much longer line *viâ* the Cape of Good Hope.

To patrol effectively the whole of the long Cape line would require a very large number of cruisers indeed, and to keep up the necessary supplies of coal, etc., for their support at such distant points great numbers of colliers and store-ships would also be necessary. The enemy having the choice of where to make an attack, will on this long line undoubtedly have a far better chance of avoiding our protecting cruisers than he would on the shorter lines through the Mediterranean.

If the Mediterranean route be adopted, we should, I think, be able to patrol it effectively, and the traffic could be so regulated as to pass those points most liable to attack by torpedo-boats in daylight under the protection of our own destroyers. The greatest objection to the Mediterranean route is the possibility of the enemy blocking the Canal by sinking a ship in the middle. Should they succeed in this, I believe that a fresh channel could be dredged in a few days time; but we must be prepared for very strong measures for the *prevention* of such a mischance, which will be more likely to occur at the beginning of the war than at a later stage when we have got things in full working order.

I would suggest the following precautions as necessary:—

The Gibraltar and Alexandria guard-ships to be stationed at Port Said, and a cruiser to act as guard-ship at Suez.

British pilots and helmsmen to be in charge of every ship passing through the Canal, with orders to steer to the bank should an explosion occur.

A sufficient military guard to be placed on board every steamer with full powers to punish treachery. As the enemy would certainly try to block the Canal before any such system was adopted, we should be prepared beforehand to take these measures at very short notice indeed.

Next in importance to the Canal route to India, I place the Atlantic route to Canada and the United States, on account of the food supplies to be drawn from those countries. These two requirements I place as only second in importance to the needs of the fighting fleets.

Of minor importance I place the following routes, naming them in the order of the importance I attach to them:—

1. The route to China.
2. The alternative Cape route to India.
3. The route to Australia *viâ* Cape.
4. The route to West Indies and South-East Coast of America.

All outside these I would not attempt to protect in any way whatever, on the principle that not being *essential* to national defence, to defend

them would be to weaken more important points. And now as to the arrangements necessary to meet the above requirements, I propose as follows:—

The cruiser squadron to be increased to 4 first-class and 16 second-class cruisers for the protection of the incoming and outgoing trade to be stationed between Gibraltar and Cape Clear with bases at Gibraltar and Queenstown.

A cruiser squadron to be formed under a rear-admiral or commodore, with headquarters at Malta, consisting of 4 first-class and 16 second and third-class cruisers for protection of the Mediterranean route. The Gibraltar and Alexandria guard-ships both to proceed to Port Said, and a division of the above cruiser squadron to have its head-quarters there.

The East Indies Squadron to be concentrated at Aden to block the entrance to Red Sea, and be reinforced to 6 second and 4 third-class cruisers.

The North American Fleet to concentrate at Halifax and Bermuda, and be strengthened to 3 first, 6 second, and 6 third-class cruisers.

The above provides for the major needs of defence.

Before proceeding to the minor needs, the first question to be considered is how far the situation will be affected by the state of affairs in China; on the whole, I think that although we have no paramount interests to consider there from the defensive point of view, it is wisest to assume that we shall be involved in that region, and that immediately on the delaration of war, before reinforcements could possibly arrive. Our fleet in Chinese waters is now a strong one, and should be equal to those of our probable opponents. It is at least possible that we may be allied with Japan in Eastern waters, in which case we ought to be more than equal to our opponents.

There can be no doubt that we have it in our power to send reinforcements from Europe to China more quickly than any other Power, consequently, if we achieve success in those waters at first, we ought to be able to maintain our superiority with comparatively slight effort by dispatching reinforcements ship for ship with our rivals, such a course would not affect the relative strength of the European fleets.

Supposing the result of the first fighting in China to be indecisive, it would certainly be necessary to send out sufficient reinforcements to turn the scale in our favour. But if by ill-fortune we are decidedly unsuccessful, I think that our best course would be to recognise the fact that the state of affairs in China would not totally affect the safety of the Empire, and to temporarily retire from these seas until the final issue had been decided in Europe. Should we, however, be allied with the Japanese, it will be absolutely necessary to support them through thick

and thin, whether successful or not. In view of the above considerations, and our China fleet being now practically on a war footing, I would not advocate sending any reinforcements from England on the outbreak of war, but would send the Pacific fleet to join the admiral in China at once. None of our possible European enemies are in a position to make a serious attack on the western shores of Canada, and even should they attempt to do, it is probable they would employ their strength to little purpose. The China and Pacific fleets would then act together at the beginning of the war, but no reinforcements would be sent until after the result of the first encounters was known; the extent of the reinforcements would then be determined by the necessities of the case.

The command at the Cape must be strongly reinforced, as in case of failure to keep the Canal route open some protection must be provided for the alternative route to India, and in any case the route to Australia will require defence. Ships will also be required off both African coasts for these purposes. The Australian fleet is, I think, sufficient for defence in those very distant waters.

I would concentrate the Cape Squadron at Simon's Bay, and reinforce it to 1 first-class, 6 second-class, and 5 third-class cruisers; provide another squadron of 1 first-class and 5 second class cruisers for the West Coast of Africa, with its base at Gibraltar; 1 first, and 3 second-class cruisers for the Indian Ocean, with headquarters at Mauritius.

The squadron on the S.E. Coast of America to be increased to 1 first and 4 second-class cruisers, and to be responsible for protection of route to West Indies and South America.

The total requirements of first, second, and third-class cruisers would then be as follows:—

Station.	First-class.	Second-class.	Third-class.
Mediterranean	6	9	9
Channel	4	7	7
Reserve	3	5	4
North Atlantic, late Cruiser Squadron	4	16	—
Squadron for protection of route in Mediterranean	4	8	8
East Indies	—	6	4
North American and West Indies	3	6	6
China and Pacific	7	9	1
Australia[1]	1	—	7
Cape	1	6	5
W. Coast of Africa	1	5	—
Indian Ocean	1	3	—
S. E. Coast	1	4	—
Total requirements	36	84	51
Total cruisers built and building, Brassey '99	37	60	44
Numbers now in commission	17	28	26
To be commissioned	19	56	26

[1] Including Australian defence ships.

From the above it will be seen that we are deficient 24 second-class and 7 third-class cruisers, and shall have a surplus of 1 first-class when all at present building are completed.

This leaves no reserve to replace ships lost or badly injured.

All cruisers building for foreign Governments in private yards would of course be seized and completed as soon as possible, this making up some of the deficiency. Fast armed merchant-steamers might be got ready, and sent to replace some of the cruisers attached to the battle fleets, and possibly some of those in the North Atlantic Squadron. The primary duty of these cruisers is to get information, in obtaining which it will often be necessary to fight; still a great use can, I think, be found for lightly-armed, unprotected fast ships, which could be obtained in large numbers from the mercantile marine; these should, I consider, be armed chiefly with 12-pounder guns in considerable numbers, so that they could beat off torpedo attack, their orders being to avoid action with fully-armed cruisers. A judicious combination of cruisers and armed merchant-men would, I think, be perfectly effective for fleet scouting work.

With the above reinforcements, I think, our present cruiser force barely sufficient to meet the first needs of war; but when war begins, new ships must be at once laid down in large numbers, and their building forced on with all possible speed, to meet the inevitable large losses which must be sustained in a prolonged war.

Sloops and Gun-boats.

There are now serving at home and abroad, including those on survey service, 18 sloops or gun-vessels, and 30 gun-boats, all of slow speed and very inferior fighting power—it is doubtful if any of these possess a sea speed of more than 10 knots; their gun armament is weak, and they have no torpedoes; for fighting purposes in modern war they have very slight value indeed.

For the police duties of peace-time and for protection of British interests on the Chinese or African rivers these vessels are much better adapted than vessels built for the high speed required in modern war could possibly be, and with regard to their employment and disposition I do not offer any suggestion until war breaks out; when this occurs, all these vessels are practically a source of weakness, as they could not hope to make a successful fight against a modern cruiser of any kind. When the great emergency does arise I think that all minor needs such as the protection of traders and missionaries must be put on one side, and these vessels put out of commission until better times; their armament and ammunition might be utilised to some extent in equipping fast merchant-steamers.

Torpedo-vessels, including Torpedo-Gunboats, Torpedo-boat Destroyers, and Torpedo Depôt-ships.

Of torpedo-gunboats there are 33, varying from 525 to 1,070 tons, 2 are employed in East Indies by the Indian Marine, and 2 in Australia by the Colonial Defence Squadron. In the Mediterranean there are 5, and 15 are in commission at home for service as tenders to coast-guard ships and for fishery protection, etc., 8 in reserve at home, and 1 at Malta. The original purpose of these vessels is so much better fulfilled by destroyers, that the construction of them has been discontinued, but until they are really worn out they must be made use of to swell the number of our torpedo-vessels, as there can be little doubt that losses of this class will be very heavy in a serious war, and that every effective vessel will be required.

Of torpedo-boat destroyers there are 109; 24 of which are in commission in the instructional flotillas, 14 in the Mediterranean, 2 in North America, 1 in Pacific, and 5 in China, the remainder being in reserve.

Of torpedo-boats first-class we have about 80 properly so-called in the Imperial Navy, 7 in the Indian Marine, and in the Australian colonies 2 first-class and about 10 second-class.

Little indeed is known as to the value of torpedo-vessels in future naval war; how they may best be employed and how the battle-ships can best be guarded against them, are questions which can only be fully answered by the experience of actual fighting; but it is, I think, indisputable that in however small a degree torpedo-vessels—and I include here submarine torpedo-boats—may fulfil the expectations of their designers that their employment in war will be, generally speaking, unfavourable to the stronger of the two contending naval Powers. Torpedo and submarine-boats are a constant menace to a Power relying on strength in battle-ships to maintain command of the sea, and consequently it is of infinitely greater importance to the maintenance of our maritime position to perfect the means of defence against torpedoes than to increase the efficiency of the offensive. To watch and destroy the enemy's torpedo-boats intending attack upon our fleets must always be the chief duty of all our torpedo craft, while attack on the enemy's ships when opportunity offers will be of secondary importance.

The following would appear to be the most important of the duties to be performed by torpedo-vessels in such a war as we are now considering:—

a. Watching all cross-Channel ports containing torpedo-vessels.

b. To act as guard boats to the Mediterranean, Channel, and Reserve Fleets.

c. To watch all ports sheltering hostile torpedo-boats threatening the Gibraltar-Port Said route.

d. Divisions of boats to be stationed at Gibraltar, Malta, and Port Said.

A very large allowance to be made for the absence of vessels coaling and making good defects.

To watch effectively an enemy's harbour a large number of vessels is absolutely necessary, whether the harbour contains many boats or few. Allowing for the absence of boats coaling, etc., I do not think any harbour could be effectively watched with less than 10 destroyers or torpedo-boats. Should our enemy adopt the policy of distributing his torpedo-vessels in a large number of small detachments, our difficulties in watching them must undoubtedly be greatly increased.

To maintain a commission and reserve in peace-time a sufficient number of torpedo-vessels to adequately watch all points at which hostile torpedo-boats could assemble is, I think, hardly practicable, and we must be content to distribute what we have to the best advantage, and strain every nerve to supplement their numbers as quickly and effectively as possible when war is upon us.

The numbers available for the services above ennumerated are :—

Torpedo-gunboats at home or in Mediterranean			29
Destroyers	,,	,, about	100
Torpedo-boats	,,	,, ,,	70

That is, a total of not more than 200 all told.

These I would distribute on the outbreak of war on the following lines :—

	Torpedo-Gunboats.	Destroyers.	Torpedo-boats.
a. Watching the cross-Channel ports ...	23	30	60
b. Guard boats to Mediterranean Fleet ...	—	15	—
Guard boats to Channel Fleet	—	15	—
Guard boats to Reserve Fleet	—	10	—
c. Under the orders of Rear-Admiral protecting Line of Communication in Mediterranean	6	20	—
d. Gibraltar, Malta, and Port Said	—	10	10
Total	29	100	70

To provide for replacement of losses, and to supplement the numbers of vessels where found necessary, I would charter all fast light-draught steamers obtainable, and arm them with light Q.F. guns as rapidly as possible. An efficient blockade can only be maintained by large numbers, and though such vessels would doubtless be greatly inferior to those designed for the sole purpose of torpedo warfare, it is to be

remembered that the armed yacht "Gloucester" sank both the Spanish destroyers at Santiago three years ago, and that what was done by the "Gloucester" might very well be accomplished again by such vessels as I have indicated. The torpedo-boats and armed steamers should, I think, be stationed to watch the nearer Channel ports, but each separate division should be accompanied by a small proportion of destroyers capable of overtaking any torpedo-boat which passed the blockading line.

To meet further losses and requirements, I would order large numbers of destroyers of the best types to be laid down on declaration of war and completed with the utmost speed possible. Outside European waters we have in peace-time 4 torpedo-gunboats, 8 destroyers, and some 30 or 40 torpedo-boats of all classes mostly in reserve at the important naval stations of Hong-Kong, Bombay, Simon's Town, Sydney, Halifax, Bermuda, and Esquimalt. The crews of the torpedo-boats could be completed by the men serving in sloops and gun-boats. These vessels would add immensely to the defences of the ports, whether other ships be there to support them or not.

When war has broken out it would probably be impracticable to send out boats to distant stations, owing to the necessity they would be under of putting frequently into port for supplies, consequently I am in favour of the present system of keeping boats in reserve at the foreign dockyards.

Torpedo-boats generally, owing to their high power and slender construction, deteriorate very rapidly, and although high speed is not so vitally important for boats in very distant waters (where they would improbably be pitted against the best ships of our enemies), as in the case of boats acting in the Channel and Mediterranean, it should be clearly recognised that these boats are wearing out, and that they should be replaced by newer and more efficient vessels in good time.

Torpedo Depôt-Ships.

Of these we have the "Vulcan" in commission, and "Hecla" in reserve. If additional vessels of this class be required in war, they can best be provided by chartering merchant-vessels and improvising them to meet the necessary requirements; to build more and keep them in commission in peace-time is, I think, not absolutely necessary, and would be an expenditure of money which could be better utilised for other purposes.

The Steamers of the Merchant Navy.

Having now disposed of all classes of vessels on the active list of the Royal Navy, I proceed to the consideration of the mercantile marine.

The first requirements to be considered in war are the necessities for the fighting fleet, everything must give way to these; and I consider the Admiralty should be armed beforehand if possible, but if not at latest on the outbreak of war with the necessary powers to appropriate any vessel sailing under British colours to their own use. The purposes for which merchant-vessels would be useful I consider to be :—

1. Auxiliary cruisers and torpedo-vessels.
2. Fleet repairing and distilling-vessels (combined), some of this class also acting as torpedo depôt-ships.
3. Colliers and store-ships.

In the Navy List are some fifty vessels of high speed and large size held by their owners at the disposition of the Admiralty with or without subsidy. The first call would be on these, and it would be necessary to equip them as rapidly as possible with light Q.F. guns sufficient to beat off torpedo-vessels and the smaller unarmoured cruisers of the enemy.

The best and fastest ships should be selected for service as scouting-ships to the fleets; large ships not necessarily of very high speed would be required for torpedo-depôt and repairing purposes. Colliers and store-ships would be taken from a lower class. All ships taken up, colliers included, should if possible, I think, be equipped with a tleast four Q.F. guns (3- or 6-pounders) to enable them to beat off torpedo-boats in daylight.

There now remains to be considered the ships of the mercantile marine not taken up by the Admiralty. Are these to be a source of weakness to us or a source of strength? The reply, I think, depends on the regulations drawn up for their guidance in war. How is our necessary oversea traffic to be conducted during war? Firstly, let us consider the convoy system, which at least ensures the ships having some protection.

The chief objections seem to be :—

1. Delay caused by assembly at the port of departure.
2. Delay to the fast ships by having to sail with slow ones.
3. The inconvenience of large numbers of ships assembling together in our harbours, and all arriving at the same time.
4. The impossibility of concealing from the enemy the date of departure, etc., and so offering him a rich prize to attack with superior force.

We know that in the past the convoy system was not an unqualified success, that the escorting men-of-war had the greatest difficulty in preventing straggling, etc., and that especially in the narrow waters the escort was not always able to protect its charges against the attacks of privateers, etc., on the outlying vessels.

Briefly, I believe the convoy system to be unworkable under present conditions, and therefore dismiss it from further consideration.

Before making any suggestion for a system to take its place, I will first put forward the following considerations :—

1. We cannot expect to get through a serious war without many losses of merchant-vessels by capture, but we can, I venture to state, without doubt, in most cases prevent the enemy turning our losses into his gain. I mean that no captain should allow his ship to fall into the enemy's hands without previously disabling his engines, so as to make it impossible to reach port except by towing.
2. It should be the endeavour of every captain when chased by an enemy, before surrendering to cause that enemy to steam as far and as fast as possible, so as to give the greatest chance of meeting with a British ship and also to exhaust as much as possible the enemy's coal supply.
3. A ship without any guns whatever is at the mercy of the smallest armed vessel, and, to take a lesson by the past, a very large proportion of the British losses was caused by capture in the narrow seas effected by rowing boats in fine weather.

A torpedo-boat might in daylight run alongside the largest unarmed merchant-ship, and, by the threat of sending her to the bottom, effect the capture. Had the merchant-man even one Q.F. gun this would not be such a simple matter.

Based on the above considerations, I would propose the following as a rough outline of a system to control the merchant traffic in war.

1. No vessel to be allowed to leave port without the sanction of the naval authorities.
2. That the captain of every ship should be obliged to follow the directions given him with regard to the route he is to follow, and that he should be given such information as is considered necessary of the stations of the protecting vessels and rendezvous, etc.
3. Merchant-men should be encouraged to carry light guns for protection against torpedo-boats and small vessels, and to endeavour to give the enemy the maximum amount of trouble in effecting a capture, should this be unavoidable.

To carry out these suggestions I would propose a scheme of national insurance against war losses for vessels carrying food, coal, and cargoes of vital importance to the country. No insurance money to be paid if the ship is surrendered in effective steaming condition, and a special bonus to be paid if an enemy is beaten off by force of arms. In return

for this national insurance the first and second conditions must be rigidly enforced, and, in granting permission to sail, the authorities would be guided not by the consideration of the owners' interests, but by the national importance of the service the vessel is fulfilling. I mean, for example, that a ship carrying corn or cattle from Canada should have the preference over one carrying less important commodities. The ordinary passenger traffic would be stopped entirely, and all persons desiring to travel on business would have to apply to the Admiralty, who would arrange for their passages if considered necessary.

By enforcing rules of the kind I suggest, our losses would, I think, be very greatly reduced, and the task of the enemy's commerce destroyers made very much more difficult. Though the ordinary merchant-vessel cannot expect as a general rule to make a very stubborn defence, she can do grand service if she draws a hostile ship from her station, and so causes her to burn extra coal; and if before hauling down the flag she can manage to burst a shell or two on board the enemy, so much the better.

As regards armament, there will, on the outbreak of war, be a tremendous demand for guns of all classes, and the wants of the Navy must be first supplied, the merchant-men will therefore have to take the discarded and obsolete weapons of the Navy, or none at all; these at present consist principally of muzzle-loaders with clumsy slides and carriages, necessitating large crews and much drill to be in any way efficient; but as time goes by the earlier marks of B.L. and Q.F. guns will also become obsolete, and the lighter varieties of these should be set aside for the purpose of extempore armament of merchant-vessels. To take for instance the 6-pounder Q.F. which is being gradually supplanted by the 12-pounder Q.F. The manipulation is simple, and two men are sufficient to work it. I feel confident that in any large steamer men could be found ready and willing to load and fire such guns before hauling down the flag, and any first-class seamen gunner should be able to give sufficient instruction in an hour before sailing to enable them by further practice to become fairly efficient. The mounting of guns in vessels not designed for them will offer some slight difficulty, but this I think could be easily got over in a rough-and-ready way by supporting the decks with shores, and laying baulks of timber on them on which to mount the guns.

By the foregoing suggestions I do not wish to be understood as suggesting that merchant-steamers can readily be improvised into full and effective cruisers, or supplant the regular service in any way whatever; but I do think they can be so equipped and encouraged that they will not be absolutely helpless, and that by increasing the difficulties of the enemy they may render great assistance in the task of national defence.

Ordnance and Ammunition.

In these days improvement in guns, gun mountings, and ammunition are unceasing. All such improvements give the ship possessing them some advantage over ships not having them, though such advantage may be outweighed by superiority in training and discipline. Cost of armament is but a fraction of the cost of any battle-ship or large cruiser; and when it is considered that the primary purpose of these vessels is to attain the highest possible offensive efficiency, it follows that no reasonable expenditure adding to that efficiency should be denied on economical grounds.

There must be some limit to the national peace expenditure on the Navy, and I would contend that such expenditure should be so adjusted that all vessels classed as effective should be kept as far as practicable up to date in all the many details pertaining to gunnery efficiency, even should the money so expended entail some reduction in the numerical strength of the peace establishment. Such a policy would result in a very large accumulation of ordnance and ammunition, etc., which, though not of the latest and most efficient types, would be available for the equipment of improvised war-vessels from the merchant navy and other sources. Modern naval artillery cannot be rapidly constructed and such a reserve in war might be invaluable for the equipment of reinforcements. Also the greatly increased demands for ordnance, etc., would produce an increase of the factories and plant in the country, which would be of inestimable advantage in a prolonged war. The extra efficiency gained in the peace establishment might conceivably result in bringing the war to a speedy termination, and at the same time we should be in a far better position to increase our forces in war, should we not have matters all our own way at the beginning.

There are, I know, great objections to spending large sums of money on re-arming and reconstructing old ships, and it is generally considered that such money is better spent on new construction. As regards ships really obsolete in design and capabilities, I am quite in agreement with this view, and consider that no money should be spent on such, beyond what is necessary to keep them in efficient condition for sending to sea in case of necessity. Such vessels should not be kept in commission, but should be retained in the Reserves at home till required in cases of great national emergency. With regard to ships, though not of quite the latest design, still from part of the active sea-going fleets in peace-time, the case I consider totally different, and no expense should be spared to maintain their armament at the highest possible pitch of gunnery efficiency.

Personnel.

Before entering into a detailed discussion of the requirements of the Navy, in peace and war, for officers and men in the several branches, a few general remarks on the present system of entry and training and the effect on the active *personnel* caused by the rapid annual increase which has taken place in the last fourteen years will, I think, aid us, in forming a correct judgment on this important question.

The first point which I wish to make clear is, that the present system of entry and training is essentially a peace growth—nothing resembling it has ever existed in the Navy during a period of serious war. In previous naval wars only the officers belonged to a permanent force, the men being entered for the duration of the ship's commission. Training-ships of any kind were non-existent. The consequence of this system, or rather want of system, was that ships had frequently to wait for long periods before sufficient men could be obtained for their crews by the press-gang or other means hardly more creditable; when the crews were obtained, the quality left much to be desired, as the following passage from James' "Naval History" concerning the ships' companies of Lord Howe's time very well illustrates:—"Much has been said by various writers on naval subjects of the manner in which the French fleet was manned, but no mention has been made of the ineffective state of the British ships when they first put to sea to meet the Republican. An idea thereof may be formed by the 'Montagu' having joined the grand fleet with only thirteen men, including the quarter-master able to take the helm, seven in one watch, six in the other. The captain of her foretop had been only fifteen months at sea. The 'Ramillies' was equally destitute of able seamen; and many others nearly so."

Such was the quality of the crews with which we commenced a long period of successful naval war; how the numbers had to be increased to meet war needs will be shown by the following figures:—

In 1793	there were	1,417	lieutenants,	45,000	men.
„ 1797	„ „	2,038	„	120,000	„
„ 1810	„ „	3,114	„	145,000	„

The brilliant exploits at the end of the eighteenth century show how rapidly the efficiency of the *personnel* must have improved, at a time when the increase in numbers was so great, and the losses so large. The secret of that improvement is, that both officers and men were learning their work in the best school of all, active and continuous war, a school which no peace training, however excellent, can ever equal.

I do not here in any sense decry the present system, which has provided us with what we have never had before: a large body of men trained to fight in ships of war, and ready at an hour's notice to do so. I do,

however, wish to establish the fact that our training is a peace system, and that when war begins it should cease entirely, all men and boys in the gunnery-schools and training-ships being sent at once afloat in fighting-ships. All further recruits, officers and men alike, will, I consider, more quickly learn their work and become useful, if sent at once to sea-going ships, than if it be attempted to teach them drill in harbours or on shore. The training in gunnery, as carried out in the schools, is, speaking generally, designed to render the men efficient to fight any gun in any ship, and also to fit them to be efficient riflemen on shore. This is as it should be in peace, and greatly facilitates mobilisation and expansion to war strength. When war has once broken out, however, this method would take up far too much time for us to think of continuing it, and we must then be content if we can teach our recruits the duties that will be required of them in the ships to which they are drafted. I have already given figures showing the increase which was found necessary in the *personnel* during a former great war, and, I think, we should be prepared to be called upon for a similar enormous war increase in the future.

That we can expect the whole increase to consist of trained, or even partially trained, men, is, I consider, asking too much, but I do think that we should be prepared with the machinery for obtaining untrained, but otherwise suitable, volunteers, and for drafting them to sea-going ships, *there* to learn their duties and become useful fighting seamen. I do not expect to find general agreement on this point. Many there are who will argue that the modern man-of-war is extremely complicated in construction and machinery, guns and torpedoes have delicate and intricate mechanism needing great skill in their manipulation, and, consequently, unskilled men—landsmen especially—will be useless.

I propose attempting to demonstrate that these opinions are fallacious. Let us take the case of a modern cruiser, the "Cressy," say, with a complement of 615 officers and men. This ship has two 9·2-inch guns, twelve 6-inch, and seventeen light Q.F. guns, for which 18 men for the 9·2-inch, 96 for the 6-inch, and 63 for the light guns, are necessary to form the full crews, or 177 in all. Of this total a considerable proportion of the "higher numbers" of the guns' crews could be replaced by absolutely untrained men—their duties do not call for special skill, and men of average intelligence would soon learn to perform them, always be it understood if they be taught those duties and no other gun drill until they are perfect. I do not argue that such guns' crews would be *equal* to those composed exclusively of fully-trained men, but I do think they could very rapidly be drilled into such efficiency, that a captain of a gun who was a good shot, with such a crew, would be more effective than an average shot with the best crew obtainable.

The same thing applies equally to the torpedo men—great skill and care are required in adjusting torpedoes, so that one fully-trained man at least is required at each tube; but I see no reason why the purely mechanical work of hoisting the torpedo up and putting it in the tube should not be performed efficiently, though slowly, by untrained men under his skilled supervision. The numbers of men, however, actually stationed at guns and torpedoes is but a portion of the crew, many others are required in magazine, in shell-rooms, and in the passages to pass the ammunition to the guns. Given a small proportion of fully-trained men to supervise each separate party, employment for absolutely untrained men can easily be found in abundance. On deck we appear to be in a far better position than in the sailing days. Helmsmen and telegraph men alone are required, apart from the captain and his attendants. No riggers or sail trimmers now to work the ship, their place is taken by the engineers and stokers below.

For purely fighting purposes, then, I see no reason why a man-of-war should not rapidly become efficient, if commissioned with a portion only of her crew trained in the peace methods of the Navy.

Next, to consider the seamanship pure and simple, which will be required of a ship's company; it is plain in these days of machinery that very few men are required to fulfil all that is required for the duties of helm, lead, anchor, and boat work, and the small amount of knotting and splicing necessary. It is certainly important that all on board should get their sea legs as soon as possible, but that will come all right after a few days at sea, and many good men in the regular service are not free from the distressing complaint of sea-sickness when first going to sea in bad weather.

Of infinitely greater importance is the question of discipline. Ready, willing, and instant obedience to command; in those naval reservemen and volunteers, who will help or supplement our naval *personnel* in war, I regard as of far higher value to fighting efficiency than either partial gunnery training, or the habits of a sea-life, though these qualities are not to be despised.

If we regard the peace *personnel* of the Navy then as a nucleus for very large expansion by comparatively untrained recruits, it follows that its training in peace should aim at a very high standard of efficiency indeed, so that every trained seaman would be a model for the raw recruits.

For the financial year, 1886-1887, the numbers of officers and men (including boys) voted for the Navy and Marines were :—

Seamen, 48,500; Marines, 12,900—total, 61,400.

For 1900-1901 the corresponding figures were :—

Seamen, 82,821; Marines, 18,590—total, 101,411.

An average annual increase of 2,450 and 400 respectively.

How long may this high rate of increase be expected to continue? And on what is the eventual maximum peace strength to depend? Supposing the present system to continue, it would seem that the numbers to which the active list of *personnel* should be raised, must depend on the number of ships that it is found necessary to keep in commission during peace, which again will depend on the efforts of foreign nations and political necessities. In addition to the officers and men serving afloat during peace will be those under training in the gunnery schools and training ships, and those required for care and maintenance crews of ships in reserve. To increase the numbers of men on active service beyond this limit will entail many being detained on shore a long time in the depôts; such a course must inevitably cause deterioration in quality. I do not contemplate that the Admiralty or Government would willingly allow the numbers of ships in commission or men to fall below what they consider safe limits to peace requirements, as there can be no doubt that the country is always ready to provide what these authorities pronounce to be necessary to meet foreign competition. It is considered by Lord Brassey and other authorities, that the increase of the active list has already been carried sufficiently far, and that all further additions to the peace strength should consist of Naval Reserves, who would serve a certain comparatively short portion of their time in the Navy.

I propose now to discuss the desirability or otherwise of such a course.

The advantages claimed are :—

1. Economy.
2. Increased efficiency and numerical strength of the Reserve itself, as these Reserve-men, who serve a period in the active Navy, will be better trained than is the case at present.

As regards the question of economy, Reserve-men serving in the Regular service during peace would cost at least as much as the long-service men they replaced, the only saving that could possibly be effected being under the heading of pensions. This saving would, I submit, be an insignificant sum, when compared with the total Naval Estimates, and the enormous sums expended on naval construction. Unless other great advantages be proved, I see no reason for the change on the score of economy.

Lord Brassey writes in his "Naval Annual," page 154, of the present year :—"Never before in history has it been attempted by any maritime Power to maintain in peace the full numbers required to man the Navy in time of war." I maintain that there is no ground for the implied assumption that England *is* attempting such a task at present; on the contrary, I consider that if it be granted that the peace needs be such as I have stated above (viz., sufficient officers and men fully to man the

ships considered necessary to be in commission during peace, and for the care and maintenance of ships in reserve, in addition to those under training), that the active *personnel*, is *below*, rather than above, the numbers necessary in times of peace. As regards the numbers for war, I think that if the history of war and the past is to be a guide, we must expect to be compelled to increase the numbers to perhaps three times the peace figures in the course of a prolonged and obstinate conflict.

Doubtless the Reserve would be improved in numbers and efficiency, but if the numbers of ships in commission be not also increased, this can only be at the expense of the active list, for should a portion of the present long-service men be replaced by short-service Reserve-men, to make the latter fully efficient, it would be absolutely necessary when not undergoing gunnery training they should be actively employed in sea-going ships; an inevitable result of this course would be that the long-service men remaining would spend a greater proportion of their service as care and maintenance parties than now is the case; such a result, I think the majority of naval officers will agree with me in describing as deplorable.

Regarding as I do the active list as a nucleus for very great extension during war, I would consent to no modification of the present system which might impair its quality in the slightest degree.

To those intimately in touch with the conditions now obtaining in the Navy, as compared with those of a few years ago, it is fully apparent that increase of *matériel* has far outstripped that of *personnel* and that despite the large increase made, the *personnel* is less adequate for peace requirements now than was formerly the case. I would, however, suggest that care and maintenance parties, and skeleton crews, should be composed exclusively of pensioners and Fleet Reserve-men, so that the peace *personnel* be set free for service in sea-going ships, in which alone they can be kept at the highest possible state of efficiency.

I do not believe that it is possible to make the average Reserve-men equal, or nearly equal, to the Regulars by any form of short service in the active Navy during peace. In war, however, I think the case is totally different, and a few months' service under its conditions will do more for the efficiency of both Reserves and Regulars alike than as many years in peace-time. The Reserves, consisting of Fleet Reserve, Pensioners, and Royal Navy Reserve, should, I consider, be kept at sufficient strength to reinforce the active list, so that all ships required on the outbreak of war should be fully manned. Further needs to be supplied as best we can while the war continues. The Naval Reserve-men, so regarded as a force on which to draw for the first needs of war, need not necessarily be very highly trained, for, as already shown, they can render very effective service as ammunition supply parties, or the higher

numbers of the guns' crews, with very slight gunnery training. On the other hand, their state of discipline is an extremely important matter, and for this reason alone I regard the present system by which recruits for R.N.R. serve for three months in men-of-war on first entry as most judicious; but I am strongly against such recruits being considered otherwise than as men under instruction, and additional in numbers, to the regular complements of the ships they serve in.

These remarks concluded, I proceed to a discussion of the peace distribution, and expansion to war strength of the officers and men of each branch in succession.

Executive Branch Officers.

Flag Officers.—The numbers on the active list should be amply sufficient to meet immediate requirements, and selection of those most suitable for the various appointments will be all that is necessary for the Admiralty to consider.

Captains and Commanders.—The numbers on the active list are more than sufficient for peace.

The first immediate needs of war would be filled by officers on half pay, those studying at the Naval Colleges, etc., and the commanders of sloops and training-ships paid off. Commanders in the Coast Guard, and captains and commanders on the retired list, will also be available for selection if necessary; the proportion of these considered effective for active service can be known only by the Admiralty.

As the war proceeds, there will inevitably be both great wastage and fresh needs to provide for; such provision will, I submit, be most effectively secured by promotion of the junior ranks for distinguished service.

Long war has in the past led to very large increase of numbers on the active list of captains and commanders, *e.g.*, the numbers increased from 276 and 167 respectively in 1794, to 639 and 422 in 1805, and 777 and 566 in 1812; these increases being almost exclusively obtained by the promotion of deserving lieutenants; the high incentive to good service offered by this method, makes it the best possible means open to us for expanding the higher ranks to meet war necessities.

Lieutenants and Sub-Lieutenants.—There is no disguising the fact, unpleasant though it be, that the numbers of these officers on the active list is barely equal to peace requirements.

Of late years the increase to the numbers of ships in the fighting fleet has reached a point hitherto unprecedented in times of peace. Great additions have also been made to the total *personnel* of the fleet; but the increase which has taken place in the lieutentants' and sub-

lieutenants' lists has not been commensurate with the additions to the lists of ships and seamen as I think the following figures will conclusively show.

By the Navy List for January, 1887, there were 157 sea-going ships in commission of all descriptions, 868 lieutenants, 43 navigating lieutenants, and 185 sub-lieutenants, or 1,096 in all.

In the July, 1901, Navy List the numbers are 256 sea-going ships in commission of all classes, 1,183 lieutenants and supplementary lieutenants, and 328 sub-lieutenants, or 1,511 in all.

Were the proportion of officers per ship allowed in 1887 maintained at the present day, there should be 1,787 lieutenants and sub-lieutenants, so that in this calculation the active list is short of 276 officers for peace requirements.

In the financial year of 1886-1887 the number of officers and seamen voted was 48,500; for 1900-1901, 82,821.

If the proportion of officers to total *personnel* existing in 1886-1887 had been maintained, the number of lieutenants and sub-lieutenants would now be 1871, which makes the active list 360 short of peace requirements.

Can it be said that the war-ships of to-day require a smaller proportion of officers than in 1887? I do not think so. Certainly the masts and sails have disappeared, so that work on deck is greatly reduced; but on the other hand, the guns being, distributed in barbettes and casemates, require more supervision than guns mounted in batteries on the broadside; the ships also are cut up into far greater number of water-tight compartments, so necessitating more officers to properly supervise the supply of ammunition, etc., in action.

Considering the simple question of the numbers necessary for peace requirements, it would appear that our resources under this head are very deficient as compared with those of 1887. However, the number of naval cadets entered has been very largely increased, and the midshipmen's list much greater than it was, and very soon the increase of lieutenants should be very rapid. Now, a long list of lieutenants in peace-time inevitably entails slow promotion, consequently, to some extent, a list of disappointed men, with something less than the maximum of keenness and zeal for their profession; the age of the higher ranks will also be inevitably raised, and this is now universally admitted to be contrary to the best interest of the Navy. Unless then some means be adopted of withdrawing those senior lieutenants who are not selected for promotion from the active list, by offering them employment in shore appointments, or by other means, continued increase in the numbers of cadets entered must inevitably entail some deterioration in quality of the officers generally.

Of the two evils I would choose the less, and prefer that the list should be as at present barely equal to peace requirements, rather than it should be a redundant one entailing the evils of half-pay, slow promotion, and disappointment.

A certain increase over the present number is undoubtedly absolutely necessary, and the disappearance of the supplementary lieutenants in the course of a few years must also be provided for; but I would most strongly warn against carrying the increase too far, and would always prefer the quality of the officers' list to its quantity in time of peace.

The active list of lieutenants and sub-lieutenants should certainly be limited to the numbers necessary for peace duties. For complete mobilisation, the sources available, and the numbers which could be obtained therefrom would be according to the Navy List of July, 1901, as follows:—

Class.	Lieuts.	Subs.
a. Staff Officers, gunnery and torpedo	30	—
b. Officers in training services	51	5
c. Officers serving in sloops, gun-boats, store-ships, etc., recommended to be paid off	127	28
d. Navigating Officers of ships in Fleet Reserve, etc.	19	—
e. Officers studying at Greenwich and Portsmouth	70	178
f. Officers on leave and half-pay and in short courses (N.B.—A small proportion of this class are physically unfit for service)	106	2
	403	213

A few selections might be made from coastguard lieutenants and the retired list; how many it is not possible to estimate without official information concerning health and other qualifications of the officers concerned, but I do not think that the numbers obtained from this source will be large. The approximate total numbers of lieutenants and sub-lieutenants who have been fully trained in the Navy, available for mobilisation are then 403 lieutenants and 213 sub-lieutenants. The lieutenants serving in the depôt are not here considered, as although doubtless many of them will be selected for active service, they must certainly be replaced by officers from the retired list or elsewhere, as the duties in the depôts will be exceedingly arduous during mobilisation and war.

The numbers of the reserve list are 439 lieutenants, 506 sub-lieutenants, and 529 midshipmen; of these 18 lieutenants, 40 sub-lieutenants, and 5 midshipmen are undergoing training in the Navy, so they may be regarded as being already employed. Some of the lieutenants R.N.R. being captains of fast mail steamers which would be required for service as cruisers, etc., it would not be advisable to call them up for service in a subordinate capacity on board other ships. Of the sub-lieutenants the large majority should be available, and many

could be promoted lieutenants if found efficient. Many of the midshipmen should be eligible for promotion to sub-lieutenant after a short period of service. Making a liberal allowance for officers absent on long voyages, and not immediately available from various other causes, we ought certainly in a very short time to be able to obtain 300 lieutenants, 400 sub-lieutenants, and 400 midshipmen from the reserve list.

This would give us, with the officers available from the active list, a total, roughly speaking, of 700 lieutenants and 600 sub-lieutenants for the immediate needs of mobilisation. These officers would be required to fill the following appointments:—

	Lieuts.	Subs.
10 First-class Battle-ships now building require	70	20
8 Second-class Battle-ships in reserve require	48	8
19 First-class Cruisers in reserve require	95	38
56 Second-class Cruisers or their substitutes in armed merchant-steamers	224	56
26 Third-class or their substitutes	78	26
9 Torpedo-gunboats	9	18
52 Destroyers	62	62
70 Torpedo-boats	70	70
Total	656	298

Thus leaving less than 50 lieutenants and about 300 sub-lieutenants unappropriated. Some of this surplus would be absorbed by the R.N.R. officers required for service in the various fleet auxiliaries; any R.N.R. officers not so employed and all the midshipmen R.N.R. I would advocate should be appointed additional to sea-going ships, there to gain experience and qualify for further duties as rapidly as possible.

As regards the selection of officers for appointments to which they are most suited, great discrimination will, of course, be necessary; the following would appear to be some of the chief points which must be attended to:—

1. To fill the necessary appointments of gunnery and torpedo lieutenants, there will be the staff officers and those under instruction in "Excellent" and "Vernon" available for the first needs. Vacancies caused by promotion and casualties, etc., during the course of the war, could, I think, best be filled by the selection of suitable officers who had shown ability in these specialities.
2. To provide lieutenants of proper qualifications to command the sixty-two destroyers and seventy torpedo-vessels, to be at once commissioned it will doubtless be necessary to select a large proportion from ships already in commission, replacing them by less experienced officers R.N. or R.N.R.

3. The R.N.R. officers should be evenly distributed amongst the different ships; to do this it will be necessary in many cases to replace officers R.N., in ships already commissioned, by officers R.N.R.

4. The officers serving in the battle-ships of the Channel and Mediterranean Fleets should, I consider, be disturbed to the smallest extent possible for the following reason: We rely on these battle-ships for the decisive issues of naval war, and to obtain success it is necessary, not only to bring them to the highest possible state of efficiency during peace, but to maintain that efficiency, and the highest possible discipline also during war; therefore, I would most strongly deprecate any alteration of their combatant *personnel* on the outbreak of war.

Cruisers are, I consider, on a somewhat different footing, their sole purpose is not fighting to a finish like the battle-ships, other duties such as scouting and reconnoitring being more important; the organisation of their crews too, for fighting purposes, is somewhat less complicated than is the case with battle-ships. Altogether I think we may safely be content with a slightly lower standard of discipline and gunnery training in their officers and men. Consequently the objection of replacing lieutenants R.N. by R.N.R. officers is not so great. The first immediate needs of mobilisation being supplied, there remains the question of replacing the losses of war, and officering all other ships for which crews can be found, whether they be old ships of the Navy (re-armed or otherwise), improvised armed merchant-steamers, or newly-built destroyers, which, if things go badly with us at the outset, should be rapidly equipped in considerable numbers.

In such a grave crisis, war will be the business not of the Navy and Army alone but of the whole nation, and it will be necessary to utilise all possible sources.

To augment sufficiently the executive commissioned ranks, we shall have the following sources to draw from:—

a. The residue of the officers, R.N.R.

b. Warrant Officers, R.N.

c. Midshipmen, R.N. and R.N.R.

d. Volunteers from the merchant service.

e. Gentlemen volunteers having no sea experience.

a. The officers, R.N.R., serving as supernumeraries, would be absorbed as their services were required, officers returning in merchant-ships from long voyages being called out on arrival in England.

b. Warrant officers should be promoted for distinguished conduct in action or elsewhere, it being most desirable that this promotion should be open to them as a direct incentive to good service.

c. I would propose that the present hard and fast rules as regards age and qualifications, should be greatly relaxed during war. Boys do not develop alike, one lad at 18 being the equal physically and mentally of others of 21, and *vice versâ*, also it is most probable that active sea fighting for a few months will be a far more valuable training than years of peace service. All our experience in the past is in favour of the rapid advancement of deserving young officers. Let captains have wide powers to promote midshipmen to sub-lieutenants, irrespective of age, provided that the sub so promoted continues serving in the same ship. This proviso will, I think, ensure that duffers are not pushed on improperly.

d. The younger officers of the merchant service should be allowed to volunteer as midshipmen, R.N.R., and would be accepted as probationers with the understanding that for good service they would be promoted, and taken into the regular service, should they so desire.

e. I would also propose that young gentlemen without sea experience of 18 to 20 years of age should be accepted as volunteers for the duration of the war only, commissions in the Navy being offered to those whom their captains consider desirable, and likely to make efficient officers.

The foregoing suggestions are made with the idea that the needs may be very great indeed, and that it is well to prepare against such very heavy demands immediately, by widening the fields to draw upon as far as possible.

To prevent undue inflation of the lists when peace is declared, the Reserve and Volunteer officers would only be put on the regular list in the event of their showing special abilities. I do not argue for one moment that these Reserve and Volunteer officers will be equal in efficiency to officers who have been trained all their lives in the Service, indeed, I think even though they should serve many years in the Navy, there would always be a certain difference between them and the regular officers. But the need we are contemplating is a very serious one, and it is impossible to maintain sufficient number of the regulars efficient in peace to meet it; new blood too is sometimes of advantage, and I am strongly of opinion that a large proportion of such officers of the merchant service and gentleman volunteers, if animated by the proper spirit and well received and assisted by the officers of the Navy, would on active service soon qualify themselves to render good and efficient help.

Executive Warrant Officers, Royal Navy.

Of these officers I do not consider there will be nearly so great a difficulty in providing sufficient numbers, as is the case with the lieutenants. Without going into detail as regards actual numbers, I think that by drawing on the many now serving in harbour appointments, and reducing the proportion of those serving for quarter-deck duties, the first immediate needs could be supplied. Losses and further increases to be made good by liberal promotion of deserving P.O.'s.

In peace-time we are greatly limited in our choice of candidates by the educational requirements, necessary for the somewhat complicated system of warrant officers' accounts. This duty not only absorbs a very large proportion of these officers' time, but actually prevents the promotion of many petty officers who, however eligible they may be for the actual executive work required of them, are incapable by lack of education of performing the large amount of clerical work demanded by our peace system. I would advocate that with the declaration of war, all account-keeping should cease, simple lists of the stores required being sent to the various storekeepers, and receipts given as they were supplied, no records of expenditure being kept at all; this would give a large number of valuable officers more time for their active work, and facilitate the promotion of eligible petty officers. The regulations already provide for some reduction of paper work in time of war, and I consider that if the warrant officers' duties be thus lightened the number of gunners and boatswains available should be sufficient for the needs of mobilisation.

Petty Officers and Men of the Seamen Class.

The numbers on 1st April, 1900, were 7,070 petty officers, 28,875 men, and 9,411 boys; the large majority of the boys being in the training-ships, and a considerable proportion of the men under instruction in the gunnery and torpedo schools, serving as skeleton crews in reserve, or awaiting their turn for sea in the depôts. That seamen should spend such a great proportion of their service on shore as is now the case is not altogether satisfactory. There is no gainsaying this, but a discussion of that matter is out of place here; suffice it to say that the general gunnery training received in the schools certainly fits the men to rapidly adapt themselves to their new duties in any ship to which they may be drafted, and that the number of men always available in the schools and depôts, except during the annual mobilisation, provides a ready source for first supply on the outbreak of war.

For some years now the *personnel* of the Navy has been increased at a very high rate annually, and as all additions are entered as boys, this has caused considerable difficulty in keeping up a proper proportionate supply of petty officers. Rates are obtained much more easily than formerly, and consequently there has been some falling off in the average ability of the petty officers. That this annnal increase is to go on indefinitely cannot be contemplated, as the limit must be reached of the numbers that it is possible to keep during peace. When the annual increase does cease, and recruiting is only required to make good normal wastage, matters should improve in many ways. The petty officers' rates will not be so cheap, and we shall be in a position to demand higher attainments. When this good time does arrive, I would also plead that an endeavour should be made to improve the general quality of our seamen by a rigorous weeding out of the idle and incompetent, of whom I fear there are far too many. A bad seaman costs just as much to pay and feed as a good one, and there should be no place during peace for those who are not willing and efficient workers. I think that, even under present conditions, we should do well to dismiss all inefficient men and bad characters who do not show signs of improvement; but while the present annual increase continues, I conclude there is no likelihood of this course being adopted. I press this point, as I would have the peace *personnel* to be regarded fundamentally as a nucleus for very large expansion during war, and if it is to be capable of such expansion it is absolutely necessary that the very highest possible standard of discipline and efficiency be maintained in peace. Boy recruits can always be obtained in numbers exceeding our demands, and the weeding process should commence at the earliest possible stage, excessive numbers being entered to provide for the wastage. Youngsters who do not promise well after a few months' trial should be unhesitatingly ejected. I quite realise that some of these might eventually become good seamen, but in the process money and time would be wasted which cannot reasonably be spared while better recruits are to be had for the asking.

For expansion to war strength, in addition to the men and boys at the depôts and under training, we have available the Fleet and Pensioner Reserve, consisting of 7,300 petty officers and men (which it is intended to raise to 15,000 men) and 21,000 Royal Navy Reserve seamen. These would all be called out immediately; and making allowance for Royal Navy Reserve-men away on long voyages, should give us a total of about 27,000. There would also be the seamen withdrawn from sloops and ineffective ships paid off, many of whom would probably be utilised for service in torpedo-boats, and armed merchant-steamers fitted out on the foreign stations. All Reserve-men should be ordered to assemble at the

depôts, and would be drafted thence, according to requirements. The older pensioners should be retained in the depôts for service in preparing ships for commission, etc., the younger men being drafted to sea-going ships as necessary.

As regards the Royal Navy Reserve-men, it is obviously desirable that they should be distributed amongst the fleet in a just proportion to the different ships. On the other hand, we must recognise the fact that if ships are largely depleted of men on the outbreak of war, these men being replaced by Reserve-men, the efficiency of these ships will be seriously impaired, especially from the disciplinary point of view. Decisive naval actions will depend to a very large extent on the gunnery training and discipline of the battle-ships. The crews of these ships have been drilled and trained together in times of peace with the sole object of obtaining the highest possible efficiency in war. The first and last purpose of the battle fleets is to fight decisively and to the last. The gunnery organisation, too, of battle-ships is, generally speaking, more complicated than that of cruisers, owing to the use of hydraulic machinery, etc. The *rôle* of cruisers in war consisting to a large extent of scouting duties, and they not being designed, as are the battle-ships, to withstand heavy injuries in action, we should, I think, be content with a somewhat lower standard of discipline and training in their crews when mobilised for war. For the above reasons I would counsel that no change should be made in the crews of the Channel and Mediterranean battle-ships, and that the Royal Naval Reserve-men should be distributed in the cruisers, and to a lesser extent in the battle-ships of the Reserve Fleet and those newly commissioned. The crews of the torpedo-vessels and destroyers already in commission should, I think, not be disturbed, but I think that use might be made of Royal Naval Reserve fishermen to form a part of the crews of newly-commissioned destroyers and torpedo-boats. I say this, thinking that to obtain the few men who could be spared from commissioned destroyers it is not worth impairing their efficiency; but when it is a case of starting a commission with a strange crew, I think that, provided there be enough fully-trained men for laying the guns and adjusting the torpedoes, other duties could well be performed by men accustomed to boat work in rough seas.

I believe that, with the Royal Naval Reserve-men thus distributed, there would be sufficient numbers of seamen available for first needs. There would certainly be a considerable shortage of petty officers, but this may, I think, be rectified by the promotion (without examination) of such men as show zeal and ability during the fighting and arduous work entailed in active service. Such promoted men should, if possible, be continued in service under the officers responsible for their advancement.

In one branch of the seamen class, it is to be feared there will be considerable difficulty in supplying necessary requirements. Signalmen cannot hastily be trained to supply deficiencies and some preparation should certainly be made to provide a reserve before war is upon us. I offer the following suggestion as an outline of what might be done:—

Telegraphy and a knowledge of the Morse code forms a most important part of naval signalling, and longer practice is required for proficiency than is necessary to learn the use of flags or semaphore. With the advent of wireless telegraphy the value of telegraph operations becomes greatly enhanced. Let us then go to the postal authorities and offer to trained telegraphists of good physique and eyesight retaining fees of, say, £5 a year, provided they learn the flags and semaphore in their own time and go through a very short course of instruction at one of the naval depôts, they binding themselves, of course, to serve in time of war. A percentage might be sent to sea annually during the manœuvres for further instruction.

For the necessary reinforcements to replace losses in action and to provide for the large increase of numbers which will certainly be required if the war be prolonged, I would propose that immediately war is declared we should call for volunteers to assemble at the naval ports, accepting all desirable men of good physique, whether seamen or not, but giving a preference to seamen. Fit these volunteers out in a simple uniform of yachtsman's guernsey, etc., and keep them in the depôts till required. In the depôts they should be accustomed as much as possible to naval method and discipline, and employed under warrant and petty officers in preparing fresh ships for service, completing them with coal, provisions, stores, and ammunition. There will be ample employment in the dockyards for large numbers of men in these duties. As necessity arises, the most efficient men would be drafted to sea, and they should be informed of this on enlistment.

I would advocate no rifle practice or gun drill for these volunteers, for the following reasons:—

1. The rifle is not essential to modern naval warfare.
2. There will be ample employment for a considerable number of men untrained in gunnery in providing ammunition, and I propose that the volunteers should be drafted originally for that duty, leaving the officers in the ships to give them such further instruction as will be possible during war.

If we look back to our previous experience in war, we learn that our ships' companies were largely composed of landsmen—as they were then called—and if we are again called upon to fight for national existence we shall assuredly have to depend on such a source to supply our needs. Let us then be prepared in peace-time with the necessary organisation

to utilise the unskilled but patriotic volunteers, who will offer themselves in large numbers from all parts of the Empire to aid the Navy in its day of need as readily as they have already done for the Army.

I would deliberately defer actually calling for volunteers till the day of war, thinking that then we shall obtain men from a more useful class than would be the case if volunteers be enrolled in peace, when busy men would be debarred from joining, and we should get a large proportion of men desirous of simply playing at sailors.

The Engineering Personnel.

Officers.—The Navy List gives the following numbers in the active and reserve lists respectively in July, 1901:—

Active.		Reserve.	
Fleet Engineers	142	Senior Engineers	68
Staff	58	Engineers	176
Chief	115	Assistant Engineers	154
Engineers	302		
Assistant Engineers	243		
Temporary Service Assistants ...	34		
Artificer Engineers	104		
Total	998	Total	398

Theoretically the active list should be fully equal to all peace needs, allowance being made for officers ill and on leave; the active and reserve lists continued should at least be equal to the first requirements of war. The peace requirements are as follows:—

All ships in commission to have their full complement of officers, which complements should on no account be reduced for purposes of economy or other motives.

Sufficient numbers in the fleet and dockyard reserves to fully maintain the efficiency of the machinery of all ships on the effective list, and to provide officers for trial ships, etc. At least one engineer is required for every ship building for which machinery is being placed in position.

Sufficient numbers for duty at the Admiralty, as supervisors at manufacturing works, for charge of gun-mounting shops, torpedo stores, etc., and for dockyard duties generally.

The active list cannot be allowed to fall below the above minimum standard of requirements with impunity, inefficiency somewhere must inevitably follow if it is so reduced. Any attempt at such reduction, whether for economical or other motives, is certain to prove exceedingly costly, in peace and war alike. In peace-time the money spent in making good defects, due to inadequate supervision, will far outrun the amount required for paying additional numbers of engineers, and in case of war it is impossible to estimate what the deficiency might cost us.

It is unfortunately the case that the numbers of officers have not been increased in due proportion to the numbers of ships added to the Navy. Judged by the standard of 14 years ago it cannot be denied that many sea-going ships are short of the numbers then considered necessary.

There is of course a large number of officers employed in the Fleet and Dockyard Reserves, but certainly not one too many for the necessary duties, and many important ships building have not even one engineer attached to them. The engineer officers in the Admiralty, and other shore appointments, are, I believe, very fully occupied indeed, and there is no possibility of reduction in their numbers. All things fairly considered in no alarmist spirit, it would seem that the active list is not at present fully equal to our peace requirements, and that considerable increase is necessary; this necessary increase is now taking place, and it may safely be predicted that the active list will be again fully equal to peace requirements in a few years' time.

As regards expansion to war strength; for supplying the officers to commission new ships, we have serving at Reserve Admiralty Dockyards, etc., the following officers:—

75 Fleet Engineers	82 Engineers
17 Staff Engineers	7 Assistants
48 Chief Engineers	33 Artificer Engineers

Some of these officers it will be impossible to disturb, even for war needs, but if the pensioned officers be called up for duty in the dockyards, I think we ought to rely on getting, say, 55 fleet, 14 staff, 45 chief, 80 engineers, 7 assistants, and 33 artificer engineers.

Sloops, etc., paid off will set free—1 fleet, 1 staff, 5 chiefs, 17 engineers, 4 assistants, and 22 artificer engineers.

The active list will therefore give us—56 fleet engineers, 15 staff, 50 chiefs, 97 engineers, 11 assistants, and 55 artificer engineers, while the reserve list will supply 398 officers if all were available; making due allowance for absence on long voyages, etc., we may put this at 320.

Are these numbers sufficient for the first immediate needs of war?

The increase of ships in commission to war strength will absorb engineers' officers to the following numbers:—

10 1st-class battle-ships.	10 Fleet engineers.	20 Engineers.	30 Assistants or Artificers
8 2nd „ „	8 „ „	8 „	24 „ „
17 1st-class cruisers	17 „ „	17 „	51 „ „
51 2nd „ „	51 Staff or chief	51 „	102 „ „
22 3rd „ „	22 Chief	22 Engineers or Assistants	
62 Destroyers		62 „	
8 Torpedo-gunboats		8 „	

or a total of 35 fleet, 73 staff or chief engineers, 166 engineers, and 229 assistant or artificer engineers.

The fleet, staff, and chief engineers may be considered together, as their duties are to a certain extent interchangeable, so that the 108 appointments could certainly be filled by the 121 officers available, without too far reducing necessary shore appointments. 166 engineers, and 229 assistant engineers' appointments remain to be filled up, and for this purpose there are 163 officers available, thus leaving a deficiency of 232 to be filled by reserve officers.

The following principles should, I think, govern the general distribution of officers in case of war:—

1. Not more than one officer R.N.R. to be appointed to any man-of-war.
2. Merchant-steamers employed as cruisers to be officered, as far as possible, as they were in peace-time, whether their officers belong to the Reserve or not.
3. R.N.R. engineers belonging to ships chartered by the Admiralty for war purposes not to be removed.
4. All R.N.R. engineers not employed as in 2 or 3 to be called out, and appointed supernumerary if not required to fill vacancies.
5. Officers R.N.R. appointed to ships already in commission to replace, as far as possible, the engineer officer second in seniority of those below the rank of chief, the officers thus set free being sent for duty as senior engineers of newly commissioned ships. Thus distributed the active and reserve lists should, I think, be about equal to the first needs of war.

To provide for making good losses, and commissioning further reinforcements volunteers to be called for from the merchant navy, and bounties offered payable at the end of the war to them, or if killed to their relatives. All engineer students to be sent at once to sea-going ships as supernumeraries to learn their duties on active service, commissions being granted to them when considered efficient by the officers under whom they are serving always provided that they are to continue serving under those officers.

Engine-Room Artificers, Consisting of Enginesmiths, Boiler-Makers, Fitters, Coppersmiths, Blacksmiths, etc. Numbers, 1st April, 1900—3,051.

We are dependent on this branch, not only for the actual running of machinery, but for its maintenance in efficient condition, and the repairs of minor defects.

In sailing days, when the motive powers were in the hand of the seaman, we were able to maintain our ships at sea for very long periods without any outside assistance; that we shall be independent to the same extent in these days of complete machinery is at present a vain hope, but

we can, and should, make every possible effort to render the ships self-supporting and independent of dockyard assistance. Nothing will tend more to this object than keeping up a strong and efficient staff of trained mechanics in every ship. It stands to reason that men who are to work the machinery, and whose lives depend constantly on its efficiency, should take more interest in keeping it in thorough order than does the dockyard artificer who remains on shore. Again, a stitch in time saves nine, and many costly items in a dockyard defect list would be saved by the presence of more trained mechanics in the engine-room complements.

The recruiting of this class is, unfortunately, beset with difficulties. There is now, and is likely to continue, a very great demand for competent engineering labour throughout the country, a demand probably greater than the supply. A mechanic who knows his work is now sure of good wages on shore where he can live at home in comfort, and these men do not take kindly to the restrictions of a sea-going life. To meet the difficulties of recruiting there can be no doubt that we have been obliged to reduce our demands as to the capabilities of the men enlisted, and to accept a class of mechanic inferior to those obtained in former years. What this eventually costs in increased repairs to machinery it is impossible to calculate. I think most naval engineers will agree with me that it is probably a very large sum annually, but the cost in peace is nothing in comparison with the risk that we are running in case of war, when it will be of the last importance to keep the motive power as efficient as possible without dockyard aid.

It is impossible to overstate the importance of the presence of first-rate mechanics on board for the maintenance of machinery in war. The system at present in vogue is to enlist men who are already trained mechanics. In times when work is scarce there is no difficulty in getting the men, but in times when trade is brisk the best men take work ashore, and the Navy is saddled with inferior men who cost as much as the superior article.

I consider this subject of such vital importance that I propose an effort should be made to free us from competition by a system of apprenticeship of boys to the various trades; they undertaking to join the Navy at the end of their apprenticeship. I would further suggest that a system be inaugurated, by which after each commission at sea, they should have a period of service in the dockyards or fleet reserves before again being drafted to sea-going ships. By this means a plentiful reserve would be created of this most important branch without costing the country a penny. Also the men would be more ready to enlist if they knew that their sea service would not be continuous till pension.

This proposal may be considered as outside the subject of the essay, but I am impressed with the fact that we lack these men in considerable

numbers for war needs, and the difficulties of obtaining a sufficient number to meet our requirements. Even supposing such a system started at once on liberal lines, it would be many years before a satisfactory reserve was established, and we have as a matter of practical necessity to consider how the men are to be raised if war breaks out under present conditions. There are, of course, plenty of capable men in the country who would soon learn the work if we could only get them to come forward. The present numbers must be divided amongst all ships commissioned, so as to have at least some who are accustomed to the service in each, and the new levies must be drafted as they are obtained to assist them, and to learn their work.

To obtain the necessary increase for war purposes, I propose we should proceed as follows :—

Offer the same rates of pay as in peace-time (to place newly entered men on higher rates without raising those of the older men would breed discontent).

But give a liberal bounty, in lieu of pension and at the end of the war, or, if a man is killed on service, to his relatives. Should a man desire to contine in the Service after the war, and his services be then required, allow him, should he desire, to count so many years' service towards pension in lieu of the bounty. The need for men will, as I have already written, be very great, and this is not a matter on which to stint expense; let the bounty then be liberal, and advertise our needs well, directly necessity requires.

Much might be accomplished in peace by registering names and addresses of suitable men willing to enter on such terms in war, and a small annual retaining fee in lieu of bounty, would, I think, be money well spent. At present we have no reserve except the pensioners.

As to obtaining the necessary volunteers, I would suggest the following as probable sources of supply :—

1. Junior engineers, donkey-men, etc., from the slower merchant-steamers, many of which would undoubtedly be thrown out of work, and laid up in war, and the engineers of steam yachts and pleasure craft.
2. Railway men.
3. Men accustomed to machinery in factories, etc., many of whom will be thrown out of work by a great war.

I propose that all volunteers should be thoroughly tested and classified according to their qualifications at the depôts, and drafted thence according to requirements. A considerable number in excess of those required for the immediate needs of the sea-going fleet should be kept in the depôts in readiness; plenty of employment can be found for them in preparing new ships for sea, etc.

Chief and Leading Stokers.—Numbers 1st April, 1901—4,475. These numbers can be augmented by pensioned stokers, P.O.'s, and by the promotion of deserving stokers.

Stokers.—17,279, R.N.R. *Firemen.*—3,500.—The proportion of reserve to regular stokers is small as compared to the reserve of seamen, where the figures are approximately 29,000 and 21,000.

The stoker recruit enters at a later age than the seaman, and his period of training is shorter, he is also generally speaking drawn from a rougher and more undisciplined class.

Naturally he compares unfavourably in bearing and discipline during the first two or three years of his service, but generally speaking, as he gets accustomed to the Navy and realises the result of good or bad behaviour, he finds his place and becomes quite as amenable to discipline in its most essential particulars as is the bluejacket, although there always remains a distinct difference of tone and manner due to the difference in early training. Would it be advisable to change the present system of stoker enlistment, and take boys at a younger age, giving them longer training? I think not, as I consider that the best and quickest training is a form of short apprenticeship, if I may call it so, in which the young recruit learns his duty from the older men in the course of active work. I consider that the recruits will be more quickly made efficient if after a short preliminary stay in the depôts to get their kits in order, etc., and to learn some essential drill, they be drafted to sea-going ships, properly distributed amongst older and fully trained men. No second-class stoker should on any account be retained in the depôts after his preliminary training is finished, and they should not if possible ever be drafted to other than sea-going ships. Get them to sea for a foreign commission, or for three years' service in the Channel Fleet as soon as possible, provided they have learnt the elements of discipline in the depôt training establishment. The period under training in the depôts need not be longer than three months.

Men who show themselves to be of really bad class during training should be immediately discharged in peace-time, even should this course result in a shortage of numbers. There is no advantage in retaining men who spend a large portion of their service in cells or gaol, and the sooner they go the better. When war does come, there can be no denial of the fact that we are in a worse position for reserves of stokers than for reserves of seamen immediately available.

The 3,500 Royal Naval Reserve firemen would not be sufficient for immediate needs even, if the war is of the serious nature we are considering. Men must be got to fill vacancies, or the ships will be useless. We shall be obliged to offer bounties or other inducements to firemen of the merchant service, and, as it is anticipated that many steamers

will be laid up, there should not be insuperable difficulties in obtaining a sufficient number. As in other classes of the *personnel*, these should be distributed amongst the regulars in fair proportion after they have been assembled at the depôts on enlistment. Outside the merchant service, volunteers could probably be obtained from factories, gasworks, iron-works, etc., who would be accustomed to attending furnaces, though unused to sea work.

On the principle that we ought to do all possible in peace-time to provide for the necessities of war, I would advocate a very large increase in the numbers of Royal Naval Reserve firemen. I do not think long or elaborate training necessary, and consider that if a man is an efficient fireman in a merchant steamer, and bears a good character on his discharges, we ought to be content to register him as effective to call out for war.

The Repairing Staff in Sea-going Ships.

Under this heading I shall consider the requirements of the Navy for carpenters, shipwrights, blacksmiths, plumbers, and armourers, etc.

The importance of these men is not fully realised outside the Navy, but upon them the efficiency of the ship depends very largely in peace, and in war their value after an action cannot be overrated. On the sufficiency of competent artificers on board to make good damage will frequently depend the answer to the question whether a ship can keep the sea and perform the duty required of her, or whether she is to be compelled to retire to the nearest dockyard for assistance. Men may be rapidly taught to work guns, etc., but unskilled men cannot be made efficient mechanics without a long apprenticeship. We have at least some reserves of seamen and stokers, but, outside the pensioners, no reserve of carpenters and armourers is available at present.

Nearly all that I have written regarding the E.R.A.'s applies equally well to this class, and need not be recapitulated in full here.

There is much reason to fear that our recruiting difficulties have caused the acceptance of inferior mechanics for artisan ratings, and that we do not get such good men as we used to. To anyone having an intimate knowledge of the many details which are necessary to the efficiency of the Navy of to-day this question of skilled mechanics appears of the last importance. All improvements, whether of machinery, gun-mountings, and other details, tend to enhance the importance of the mechanic as distinguished from the seaman or unskilled stoker. Generally speaking, improvements of the mechanism of guns, etc., tend to reduce the amount of skill in handling them, but call for increased skill in keeping them efficient. For instance, it is much easier to shoot well with the

Q F. guns now in use than with the M.L. guns of twenty years ago, but the M.L. guns, on the contrary, had not the delicate mechanism to be kept in order which the armourers now have to deal with.

I think, while much attention is devoted to the provision of seamen both active and reserve, this question of the supply of sufficient mechanics for peace and war is very apt to be overlooked. Should war break out now, we should undoubtedly feel the want very hardly, and would be obliged to make the best of matters by enlisting mechanics of any kind by means of bounties, etc. To ensure a better state of things in the future I would propose that a system be gradually introduced by which all repairs to ships, guns, and machinery should be carried out by naval mechanics in the Fleet or Dockyard Reserve workshops, the present dockyard workmen being employed solely on new construction. By this means the mechanics, whether E.R.A.'s, armourers, or belonging to the carpenter's staff, after serving at least one commission at sea would in peace have alternate periods of sea and home service. The numbers for peace service would of course have to be very largely increased, but as the work done in the reserves would replace dockyard labour additional expense would not be necessary. The men not being required to serve continuously at sea, recruiting would, I think, be facilitated, and the increased numbers be forthcoming in course of time. In the event of war all would be available for sea service, the dockyard staff temporarily taking over the work of repairs. A small beginning has been made in this direction by the entry of shipwright apprentices in the dockyards to be trained for sea service, and it is to be devoutly hoped that this principle will be greatly extended.

Such changes are for the future, and should war break out now, we shall be obliged to call for volunteers to meet our needs and take the best men we can get. The pressure in war would be greatly relieved if we set about at once registering suitable volunteers in peace, giving them, if possible, a small retaining fee. Suitable armourers and blacksmiths could doubtless be found in the workshops of the manufacturing towns, and shipwrights amongst yacht and boat builders.

ROYAL MARINES. NUMBERS, 1ST APRIL, 1900:—OFFICERS, 443; WARRANT OFFICERS, 39; NON-COMMISSIONED OFFICERS, 2,179; MEN, 15,800. TOTAL, 18,461.

Without in any way disparaging the Marines, and the invaluable service they have rendered to the Navy in the past, it may be conceded that they are in no sense so vitally essential to the Navy as are seamen and stokers.

The corps was originated in a time of war, when sufficient seamen could not be obtained for our needs, and soldiers of certain regiments were embarked to make good the deficiency. This expedient being initiated, has never been discontinued. But supposing the possibility of starting with a clean slate to organise a Navy, it is probable that Marines would not be included as a part of the ships' companies. However, we have not to deal here with an ideal, but with the actual state of affairs. Marines do form a very considerable and effective part of our available *personnel*, and as such we have to consider them.

It has been proposed that the Marine forces should be very largely increased and given the duty of garrisoning the coaling stations, the Army being entirely relieved of the task of their defence.

The sense of naval officers is generally opposed to this scheme for the following all-sufficient reasons.

1. The fighting fleet is an essentially mobile force, ready for service wherever the ships will float and the enemy is to be found; to charge its commanders with the additional duty of defending fortresses, is to attack this quality of mobility at its very root, and therefore amounts to a fundamental error.
2. If Marines were charged with this additional garrison duty, in the event of a serious war, marine reinforcements would be required for the garrisons, in addition to the large numbers required for the ships; and the manning of the Navy must inevitably suffer.
3. By the requirements for garrison duty, the proportion of land to sea-service in peace must indubitably be very greatly increased; indeed, it is probable that we should have a great number of so-called marines of some years' service who had never served at sea at all. From the naval officer's point of view, if not from the marine officer's, this would be an unqualified evil, and the present value of the Marine detachments on board ship greatly reduced.

Let us hope that this proposal for the relief of the Army at the expense of the Navy and Marines, will be resisted without compromise.

The peace services of Marine officers and men is, theoretically, divided into the purely military service in barracks and the mixed naval and military service when embarked. The embarkation is governed by roster, and it therefore happens that while the majority of officers and men do actually embark in sea-going ships, there remains a considerable number who embark in the naval depôts and training-ships, and worse still, as caretakers of the numerous obsolete hulks in the reaches of the

Medway, Porchester Creek, and the Hamoaze. This state of affairs is not by any means satisfactory. From the naval officer's point of view, the young marine officers and the recruits are not fully efficient until they have gained some experience of the work and interior economy of a sea-going man-of-war; to send junior subalterns to naval depôts and appointments of such a nature before they have had any sea experience does not give them a fair start, and their first impressions of naval discipline and methods, gained there, are not advantageous. With regard to the men, the large number absorbed for the duties of ship keeping in Rotten Row is highly prejudicial to good discipline and efficiency. I fancy that most marine officers will agree with my plan to replace the ship-keepers by pensioner caretakers.

I would also advocate some modification of the roster system, by which all first appointments of Marine subalterns should be to sea-going ships. With these slight modifications I would leave the disposition of the Marine forces in peace-time as it is at present.

With regard to war expansion of the corps, I should not advocate extension of recruiting.

The value of Marines to the Navy depends primarily on their ability to take their place in fighting the ships, and secondarily in their military training and discipline. If more ships, and therefore more men, are required, it will be better to enlist and train them as seamen; military training in such an emergency would entail loss of time—the all-important element in war. In times of such pressure as we are now considering, however, naval officers will only be too glad of any help from disciplined military forces to supplement the probably inadequate levies of partially trained seamen; and when crews have to be made up, not of the trained seamen we want, but of a mixture of the landsmen, Volunteers, Naval Reserve, and fishermen, with a proportion of Royal Navy seamen, that we shall get, the presence of a small disciplined military force would be invaluable.

It was in such a crisis that the Marine force was originally organised from Line regiments.

Whether the Army will again be able to come to our assistance in this way, must depend on circumstances, and if any oversea expedition is in progress or not. If the enemy is fighting on a land frontier we can expect no help of course, as every soldier will be required for work on his proper element; but supposing a struggle for command of the sea without a military expedition in progress, some infantry regiments might be utilised for the purpose; if so, I feel sure they would be a most useful and welcome reinforcement. But such military aid should not be accepted unless the men are disciplined soldiers serving under their own regimental officers. Recruits in Marine uniform are not what is wanted.

Medical Officers and Attendants.

We have only sufficient on the active list for peace needs, and there is no reserve. We shall, therefore, be obliged to call considerable outside assistance in war; this would, doubtless, be forthcoming, but all-important time would be gained by registering suitable volunteers from hospitals, etc., in peace-time.

Accountant Branch.

The numbers available at present are only equal to peace requirements, but the regulations provide for considerable reductions of paper work in time of war, so that smaller clerical staffs will then suffice.

Sufficient clerks could probably be obtained as volunteers to meet necessities; but even should this not be the case, no naval officers would allow a deficiency in this branch to mar the efficiency of his ship in war.

Domestics and Bandsmen, etc.

Although these ratings are not essential to fighting efficiency, I do not consider that they should be classed as non-combatants. Every officer and man on board a man-of-war has his appointed duty in action, and only those in attendance on the surgeons can, strictly speaking, be classed as non-combatant.

Ships unable in war-time to obtain their proper complement of domestics and bandsmen, etc., would most certainly require an equivalent number of men of other ratings to make good the deficiency in ammunition supply parties. In time of peace these men are, generally speaking, entered for non-continuous service, and many of them are not British subjects, which is perhaps not very desirable as regards fighting efficiency, however convenient it may be in ships on foreign service. It would, of course, be possible to enter British subjects only, and to make them undergo some gunnery training. I do not, however, consider such a course desirable, because it would add immensely to the difficulties (already great) of obtaining suitable men in peace, and cause great inconvenience and discomfort to officers, while the gain in fighting efficiency would be extremely small. I would, therefore, leave the system of entry in peace undisturbed. For war purposes bandsmen, as such, will be unnecessary, but an equivalent number of untrained volunteers should be allowed to every ship in lieu. A certain number of officers, cooks, and stewards is, I think, if not absolutely necessary in war, certainly desirable, the best class from which to draw volunteers would

be the stewards and cooks of mail steamers, many of whom would probably be thrown out of work on the outbreak of war.

Workmen in Dockyards and Arsenals.

In addition to officers and men employed afloat, the efficiency of the fleet must greatly depend on the men in the various dockyards and arsenals, who will in war be employed at very high pressure in fitting out ships, making new guns, and stores, etc.

Without entering into a discussion of the conditions of these men's service, there is one point to which I would draw attention, and that is the question of volunteering. My opinion is that all these men will render far more efficient service to the country by sticking to their proper work than by joining Volunteer corps as amateur soldiers; and thus being the case, they should under no circumstances be allowed to do so. They can at best be only an addition to the paper strength of the Army, as it is inconceivable that the Admiralty would ever allow them to leave their proper work during a time of serious European war.

Concluding Remarks.

In conclusion of this essay, I will now recapitulate briefly the arguments on which my proposals have been based:—

1. *The Necessity of Preparation for Retrieving Reserves at the Commencement of a Great War.*—Admiral Sir Cyprian Bridge, in a chapter of the "Naval Annual" for this year (1901), gives a number of most instructive instances from all periods of history of the unexpected failure in war of naval and military forces of all countries after prolonged periods of peace. Nothing that I can write could add any weight to his arguments against a complacent confidence in the sufficiency of a force untried in war. It is to meet the contingency of such a failure that I have advocated preparation to use the whole strength of the Empire to enable us to retrieve our marine supremacy.

2. *The Necessity of Concentration of Strength in War; which involves Leaving Positions not Essential to National Defence More or Less Unprotected.*—This proposition will be self-evident to all who have studied the science of war on land and sea alike; to act up fully to the principle will, however, be increasingly difficult for the authorities in these days of popular clamour and uncontrolled Press. The peace duties of our Navy over a world-wide Empire also will make a thorough concentration very difficult in war. On this principle of concentration I have advocated:—

a. That the battle-ships should as far as possible be kept in European waters, and that those which will be required to act in the same fleet during war, should be well practised together in peace.

b. That sloops and gun-boats having neither strong offensive powers nor high speed, however useful they may be in peace, should in war be instantly put out of commission. No cruiser which is slower than the average battle-ships should have a place in a perfectly constituted Navy during war. My opinion is that we can better employ our limited numbers of trained officers and seamen by placing them in fast merchant-steamers, however lightly armed and protected these may be, than by locking them up in slow and lightly armed gun-boats.

c. That we should not attempt to protect far-distant colonies, such as Australia, in great force. There will, of course, be a very strong local demand for such protection, but this must be more strongly resisted. Australia can be far more efficiently protected by a strong fleet in home and China waters than by any local defence we can afford to give her. It will be impracticable for our enemies to make any successful attack in force on such distant points before England has lost command of the sea, and by detaching many ships for Australian defence we should certainly run considerable risk of that loss by reducing our strength at more important strategical points.

3. That the route to India viâ Mediterranean should be strongly held, because:—

a. This policy will probably lead to early and decisive fleet actions, which I think is to our advantage to court.

b. Although this route passes near the enemy's ports, I think that it could be protected with greater certainty than the long ocean route.

c. The gain in time, if reinforcements are required in India, will be of the utmost importance.

4. That the Vitally Important Question of Food Supply in War can best be solved by inducing the Mercantile Marine to assist in its own Protection.— A very large proportion of our losses in the past was caused by the action of small, swift, and well-armed privateers acting in the narrow waters of the English Channel.

Should our steamers continue to put to sea in war absolutely unarmed, the enemy will be tempted to again attack them in a similar manner, consequently I would encourage them to carry light guns in war solely for their own protection.

By adopting definite tracks, which could be changed at intervals, and ordering all steamers to pass through certain rendezvous, the problem of defence of trade routes would be greatly simplified.

To increase the difficulties of the enemy in carrying off prizes, steamers whose capture appear inevitable should disable their engines.

The best means of introducing the mercantile marine to thus aid in its own defence is, I think, a system of insurance (national or otherwise) by which the insurance money would only be paid when the necessary conditions were complied with.

The question of sailing vessels I have left untouched; war on a great scale must inevitably cause them to be laid up.

5. That the whole of the Active Personnel During Peace should consist of Long-service Men of the Highest Quality in Discipline and Training that it is possible to obtain.—The average professional who devotes his life's work to a profession must always be superior to the average amateur, and the Royal Navy is no exception to this rule; were it such an exception, there could be no question that there was something very radically wrong with its system of training and employment. However, many writers on naval subjects, being strongly impressed with the importance of a large Reserve for war requirements, have advocated a modification of the present system by which it is intended to substitute a proportion of short-service men, who would enter the Reserve at the end of their active peace service for an equal number of long-service men and so give us a greater number of trained seamen available for war requirements.

I have argued against the proposal, for the following reasons:—

a. That the efficiency of the long-service men would suffer.

b. That the progress of naval science is so rapid that the Reserve-men would in a short time lose their efficiency, because of the many improvements and changes effected since they left the active service.

c. That in any case the short-service men would be inferior in efficiency to the long-service.

6. That the Active Peace Personnel should be Supplemented in War by the Fleet, Pensioners, and Royal Naval Reserves for the first immediate requirements of Mobilisation; after which we should depend on untrained volunteers to replace losses and make further increases.—I have attempted to show that there is ample work in action for untrained men (always provided that they will do what they are told) in passing up ammunition and kindred duties, and would therefore advocate stationing the Reserves and volunteers to those duties, so setting free fully-trained men for service in other ships. Such a course will obviate the necessity of very high gunnery training for the present Reserve-men, and would facilitate the employment of untrained volunteers in war.

VOLUNTEER ARTILLERY: PAST, PRESENT, AND FUTURE.

By Lieut.-Colonel A. G. HAYWOOD, late 6th Lancashire Vol. Art.

Wednesday, 12th March, 1902.

Lieut.-Colonel the Earl of STRADBROKE, 1st Norfolk R.G.A. (Volunteers), President National Artillery Association, in the Chair.

I WILL not weary my audience with a history of the rise and progress of Volunteer artillery since the year 1859, when the Volunteer movement had its birth, nor since the Act of 1863, when Parliament first granted certain sums of money for its sustenance in the form of a capitation grant, very little less than what is paid to-day. Suffice it that in this year 1902, so far as position artillery is concerned, it is armed with two patterns of Armstrong guns, and one pattern of an obsolete muzzle-loading field gun. The garrison branches, when situated contiguous to modern forts, use the guns therein placed; elsewhere various patterns of siege guns, more or less up-to-date, for drill and practice.

A system of horsing movable artillery is permitted in England which is very faulty, for reasons I will deal with later; while the small-arms supplied are not practised with to any useful extent, except so far as they can be used for prize-taking; while throughout this branch of the Volunteers a particularly hazy idea of the tactics of the arm pervades all ranks.

There may be present this afternoon some who attended a series of meetings in the Theatre of this Institution on the 21st, 22nd, and 23rd of January, 1878, twenty-four years ago. The occasion was a conference on "The Requirements of the Volunteer Forces": when questions of organisation, of finance and interior economy, of officers and of men, of military training and of fitness for national defence were discussed. The pivotal paper was read by Colonel Sir Howard Vincent, then Lieut.-Colonel Commanding the Central London Rifle Rangers (XL. M.R.V. Gray's Inn).

Colonel Sir Howard Vincent's paper dealt with questions of numbers as against efficiency, of the absence of cavalry and field artillery, of insufficient funds, of the expense of uniforms and equipment, of the difficulties of finding officers, of the general training of officers, of the

inducement among men to enrol, of the length of engagements, of the difficulty of finding spaces in which to drill and practice manœuvres, of the standard of efficiency, of ranges, class-firing, camps of instruction, and, finally, of the fitness of the force for national defence, and whether it is as ready as circumstances permit. These are some of the fifty questions this officer raised at that time, with each one of which he dealt exhaustively. The main point is that a quarter of a century has passed by, and in the main his questions still await answers.

Many Volunteer officers of the artillery branch who took part in the discussion agreed that the capitation grant should be much higher for the artillery than it was, because of the greater expenditure involved in the drill of this arm. Some of them considered that the Government should take over drill-sheds, should provide clothing, and in other ways relieve commanding officers of financial burdens, which it was then considered obvious the country had no right to impose upon them. To-day we have a much larger number of batteries of position, our men possess great-coats, camp is a regular institution, but commanding officers receive much the same grant. Officers of this arm, owing to agitation, instituted in the first instance by the oldest tactical society in the kingdom, the Manchester Tactical Society, have the privilege of subjecting themselves to examinations in several branches of military science, and a rather optional examination, called the "A" examination, is expected to be passed by officers of Volunteer artillery in addition. No steps have been taken by the authorities to institute, in those localities where Volunteer artillery are in the greatest numbers, schools for the instruction of officers, superintended and controlled by competent instructors, open during the hours when Volunteer artillery officers can find time to attend them, a time which must not clash with the hours of their business. Standards of requirements have not been set up below which an officer may not fail in knowledge without the risk of supersession or dismissal; but this may arise from the fact that the actual *rôle* to be played by position artillery in time of war has not been fixed by the authorities themselves, consequently there arises a difficulty of fixing upon a standard. Yet it appears to me that, if the Volunteer position artillery has a place in the defence of this country, there should be no difficulty in fixing on such a standard, the absence of which permits of so much variety in the value of such officers.

No one will gainsay that, to make good pupils, good teachers are necessary. The Volunteer force is essentially a peace force, consequently these officers are primarily teachers rather than leaders of men; and, perhaps, one of the most difficult things men are called upon to perform is teaching. It necessitates, in the first place, tact, patience, and knowledge. There are many, very many, officers of all branches of

the Service, who, failing the two first, find it difficult to impart the third to others as they earnestly desire to do. The advantage that the Regular and the Militia officer possesses over the Volunteer is, that he is taken in hand on all sides, instructed in all his duties amid surroundings which assist him, and in an atmosphere filled with results of years of habits and associations. He is not permitted to depart from the system which has grown up with his regiment. If a question arises, there are a hundred precedents to settle it. The Volunteer officer, on the other hand, has few such associations to fall back upon. He is permitted, as a rule, to enter upon the early glory of his career and to accept responsibilities long before he has reached that level of ability to teach which makes him at least equal to the non-commissioned officer under his command. Indeed, in too many cases, distinct evidence of an intention to shirk, in all the irksome duties of his profession, are visible; but, all the same, such youths by sitting tight may reach the highest rank in their brigade, the fatal habit of their youth never leaving them; but complacent seniors and the absence of a standard permit of such a result.

It may be said that this is true of the Volunteer force as a whole, and perhaps in a greater degree of the other branches than of that I have been for twenty years a member; but I am asked to deal with the question of the *future* of Volunteer artillery. The close association with a very large number of officers locally in Liverpool, and some association with officers in Manchester, in Birmingham, in Glasgow, and elsewhere, when practising kriegsspiel, convinces me that if the force as a whole has been found wanting, it is due to the absence of means of thoroughly teaching those who have to teach. A general knowledge of drill, but the absence of that daily and hourly contact which a Regular has with his men, can produce in the Volunteer results of no great value. The new regulations imply that the authorities consider that for the amount of money spent better results could have been obtained; but I venture to say that the authorities themselves are as much deceived as the Volunteers in thinking that the results are due to laxity rather than to this want of teaching power, which I claim is no fault of Volunteer officers. On this point I do not think it out of place to venture an assertion. Those Volunteers who are notably expert instructors find no difficulty in raising their batteries to full strength and obtaining a high degree of general efficiency. It may be said that such men are scarce, but I will further assert that if the greater number of young officers are taken in hand seriously and systematically they will be found to possess the required qualities in a degree sufficiently high to attain our object.

I do not claim that this is a complete solution, but I do claim that before the Volunteer force is either directly or indirectly blamed for inefficiency, a serious, even if troublesome, attempt should have been

made to introduce the system of sound instruction amongst those who are there to instruct—namely, Volunteer officers.

We may now turn our attention to a question which has always been one of difficulty—that of administration. It has always seemed to me to be false economy to pay for the Volunteer force on the basis of a capitation grant. It is quite obvious, as Sir Howard Vincent pointed out a quarter of a century ago, this system puts *numbers* before *efficiency*; consequently, if the authorities twenty-five years later find efficiency has been sacrificed to numbers, the obvious reason is that this system of grant is the cause, not the Volunteers themselves.

It must be very plain that there is a wide, inherent love of soldiering in this country, otherwise, capitation grant or no capitation grant, we should have no Volunteer force. Granted that there is this love of soldiering, and that this system encourages numbers rather than efficiency, the substitution of a totally different system would in no sense diminish this innate love of soldiering, but might make it possible to obtain both numbers *and* efficiency. At present there are in Great Britain upwards of sixty-five brigades of artillery (not dealing with engineers and infantry). These brigades are housed and drilled in sheds, for which annual rents are paid. Some are freehold, others leasehold, some costly, others cheap and inefficient, but it must be quite obvious that the average rents paid are much higher than would be represented were such premises owned by Government. Again, Volunteers are clothed by all manner of private contracts, but such contracts represent a profit to the contractor. Did the Government clothe these Volunteers themselves, or provide the necessary cloth, such profit would be a saving to the country. Consequently, in suggesting that the War Office should open a department for the requirements of such drill premises as can be bought outright, to advantage, and the administration of those others that cannot be so purchased, but are awaiting better sites or better opportunities, at the same time providing the clothing of all men who join, under local supervision, as they provide guns, carbines, ammunition, and stores, the whole time and attention of all officers can then be demanded to raise the standard of drill to that height which the mobilisation scheme of the country requires. Compulsory service, which is the alternative of Volunteers, will necessitate all this, I mean in a very high degree. Forty-two years of experience of the Force must surely have made it plain whether it is worth stimulating in order to avoid conscription, and if money would have to be spent in the latter alternative, surely it would be wise to spend some now in order to make a willing Force competent to carry out these self-sought duties.

The time has now arrived when I propose to consider some questions regarding the *matériel*. It is well known that the gun which will be the principal arm of the Volunteer artillery is the 4·7 quick-firer. The character of the carriage has not yet been fixed, I understand, but at the best it is a gun suited to accompany infantry, to take up a prominent position in the defence, and no attempt to compete with the Royal Horse Artillery can be made. It has for many years seemed to me singular that the system of driving by long reins from the limber with all the gunners "up" has not been introduced. A great many years ago I had a controversy with Major Stone, who was then a staff officer, I think, at Dover, on this subject. I have had controversies with Regular officers frequently since then; but I have never been convinced that the system I advocate is not a good and sound one for Volunteers who may wish to move a column of artillery and bring them up to the firing point as fresh as possible. I know of nothing more fatiguing than leading horses by the bridle with movable artillery; but that this system is not introduced surprises me, considering how easy it is to obtain drivers accustomed to it and horses accustomed to it. Perhaps some enterprising colonel has made the experiment, and can give us the benefit of his experience.

In the fifth section of "Field Artillery Drill," edition 1896, instructions are given for driving with long reins from the box seat, while I think that the present war has brushed aside any tendency to retain the ideas of what was once falsely considered smartness.

In a few words, with Volunteer artillery and with the necessary short service, even the intermittent service natural to it, our horses are not specially trained to gun work. It appears to me that if we require to move the vehicles which carry guns from one place to another at the least expense under these conditions, and yet when they have arrived at their destination that guns, horses, and men shall be in the best condition compatible with these conditions, we must adopt a system which, both as regards men and horses, is as little removed from their ordinary duties, or from the habits they have formed, as possible.

The gun: this is not a matter for criticism in a paper like mine, for it is a good gun, and of such modern construction that the Volunteers may well adopt it; but I see no particular use in forming position batteries or movable batteries, furnished with guns of a lighter character, as, for instance, the now obsolete, out-ranged 16-pounder muzzle-loader. I have thought the matter over for a long time, and within my limited knowledge of the possible requirements of movable artillery in the defence, I cannot see anything to be gained by having two natures of movable guns, if the chief one is capable of a mobility equal to that of infantry. The Imperial Yeomanry is now entirely differentiated from the Volunteers, consequently if they require artillery for their purposes

it should be furnished by a body serving under the same regulations, in which case the horses and the men would be specially paid for and trained.

Providing the 50,000 Volunteer artillery with carbines, yet abstaining from demanding any standard of skill, either argues that the arm is given to them to amuse themselves with, or for ceremonial purposes; but if Volunteer artillery are to form an integral part of the defences of this country, those who are not actually working the guns in time of war may well be looked to to assist in providing an escort and cover for the guns; consequently, whatever trouble it may cause, rifle shooting is a necessity—I see no virtue in a carbine, for Volunteer artillery, over rifles.

The continuous drill and practice of a battery of Regulars permit each individual to practise the duties until he is perfect in the work of each separate gun number. The conditions of service in any Volunteer force as at present constituted rather encourages the active few to learn their business, and consequently they are continually selected for manning the guns, while the less active, or worse instructed, or the more indifferent, stand aside as reserve. Were officers of Volunteer artillery themselves thoroughly grounded in their work, the system of depending upon the smart few could be over-turned with safety; but there is so small a power of teaching in the higher ranks of Volunteer non-commissioned officers and junior officers, that at present a change in this direction might prove dangerous; consequently the new regulations, while aiming at getting rid of the men who stand by and look on because of the absence of such teaching powers, are looked upon as harsh, and it will end in our losing the services of the very men we wish to retain. This consideration brings in its turn a further one—that of the necessity for the production and publication of Artillery, Engineering, and Infantry "Volunteer" Drill Books, issued under authority, and embracing the details of what Auxiliary forces are required to know in fulfilling their *rôle* in national defence, which means that every particle of what is not necessary is eliminated, and emphasis laid upon that which is essential. With such a drill book in his hand, a colonel of Volunteers would know exactly how to set out his annual programme in order to fulfil the obligations required. With such a drill book in his hand every Inspecting Officer, whether he were a stranger to Volunteers or not, would know what to look for and what to report upon. The forces drilled up to such a standard would, whether in the south or in the north, be equally at home under any officer they might be called to serve under, whether Volunteer or Regular. I have no hesitation in saying that did the authorities move definitely in this direction they would be surprised with what cheerfulness apparently arduous tasks which they might set for Volunteers to carry out

would be met. To a working man a summons to a parade, which might last but five minutes, if called for a time when he should be at work, would more certainly cause him to resign than another of many hours' duration at a time when he is free. To those of us of many years' experience it would appear as if this were forgotten; or again, every general officer commanding districts on the promulgation of new regulations finds streams of remonstrances flowing through him, pointing out what many of them acknowledge are difficulties, which, had Volunteer officers themselves been consulted, would never have arisen. General officers, to their credit, do endeavour to smooth these difficulties over, but there are many which they cannot cure, and these remain as a constant source of friction and loss.

My paper had to deal with the future of Volunteer artillery. There is a sound future before it; there will be found no lack of numbers; there never has been lack of spirit, but there has been a plentiful lack of knowledge displayed by those charged with the administration, in high quarters, of the conditions of life, livelihood, and spirit of the citizens who are so willing to be unpaid soldiers of our King.

Colonel LONSDALE HALE (late R.E.):—To most of our small audience, perhaps, the lecturer is not personally known. It has been my good fortune to know Colonel Haywood for very many years past. I can speak of him as one who, in the important Volunteer centre of Liverpool, was, if not the leading spirit, at all events one of the very foremost of the leading spirits, in that great place from which come so very many Volunteers. He has been one of the leading spirits in trying to do what he points out in his lecture is so necessary for Volunteer officers—teaching them to be teachers. He was the life and soul of the Liverpool Tactical Society, and I have had the good fortune of witnessing in many cases the benefits derived from his efforts. Colonel Haywood, therefore, deals with this subject, having a thorough, practical knowledge of it. I had not seen the paper before it was put into my hands this afternoon. I was delighted to find that the author devoted so much of the paper to the weakest point in connection with the Volunteer force, the weak point for which the Government of the country, and not the Volunteers themselves, is entirely responsible, namely, teaching Volunteer officers to become and act as teachers to their men. There are three extracts which I will recall to the minds of the audience:—"No steps have been taken by the authorities to institute, in those localities where Volunteer artillery" (or I will say Volunteers—it does not matter whether they are artillery or not) "are in the greatest numbers, schools for the instruction of officers, superintended and controlled by competent instructors"—and this is the important point of the paragraph—"open during the hours when Volunteer artillery officers can find time to attend them, a time which must not clash with the hours of their business." The next paragraph is:—"The close association with a very large number of officers locally in Liverpool, and some association with officers in Manchester, in Birmingham, in Glasgow, and elsewhere, when practising kriegsspiel, convinces me that if the force as a whole has been found wanting, it is due to the absence of means of thoroughly teaching those who have to teach." The third paragraph is:—"I do not claim that this is a complete solution, but I do claim that before the Volunteer force is either directly or indirectly blamed for

inefficiency, a serious, even if troublesome, attempt should have been made to introduce the system of sound instruction amongst those who are there to instruct—namely, Volunteer officers." I think I have posed as nothing more, in my long professional life, than that of a teacher, and I think I know something about teaching. I know a great deal from the teacher's point of the Volunteer force. My knowledge is probably more extensive even than that of officers like Colonel Haywood, because his is local, whereas I have had the advantage of going all over the country to tactical societies in Scotland, England, and Wales, and teaching by means of the kriegsspiel, or war-game. I do find a very great deficiency, and even in our tactical society here I find a great deficiency amongst Volunteer officers of that knowledge, without which they cannot hope to teach their men. Whence does this arise? I hold it arises from a misconception on the part of the authorities of the conditions which must be fulfilled in order to enable the Volunteer officer to become a teacher of his men. It is no good to place in a district a so-called garrison instructor or a deputy-assistant adjutant-general for instruction—as he is now called—and to institute classes on certain days at certain hours. That will not give the Volunteer officer any means for learning his work. It is all very well for the Regular officers in the district who have nothing else to do but to attend to their profession. They are knocked off duty for the purpose of going to those classes; the classes are arranged at times which will suit them, and it is part of their business to go there. But Colonel Haywood hit the nail on the head when he says that you must fix for the Volunteers a time which will suit them with regard to their business hours. I have often found, especially down in South Wales, that the only way to convey this instruction to the Volunteers is to place in each district an officer thoroughly competent to give instruction, and to say to him: "Now, Captain or Major So-and-so, you are to start the Volunteer instruction in this district, and if you do not do it you will have to go." Then this officer would not have on Monday, Tuesday, Wednesday, or Thursday at 10 a.m., for two hours, his class of instruction. He would find out when the Volunteer officers in that district, in tens or elevens, or in twos or threes, could come and receive instruction from him. He should be a centre, as we old garrison instructors were when garrison instruction was started. I was one of the first sixteen who were appointed in 1870. Colonel Middleton, afterwards Sir Frederick Middleton, was our inspecting officer, and he simply gave us this order: "You must teach something and teach it somehow." It was left to us to get the material for the classes, and with the sanction of the general commanding the district to form them and give the instruction whenever we could. If we had not managed to do that, I am perfectly certain Sir Frederick Middleton would have told us to go away, and would have substituted somebody else for us. That is the point. I cordially agree with Colonel Haywood that the Volunteer officers are far more sinned against than sinning with regard to their deficiency of tactical and other knowledge. They have not been given the opportunities which the Regular officer has been given. They may have nominally been given them, but everybody who knows anything about the Volunteer force knows that the system of instruction must be elastic. I am perfectly certain of that. Let me give you one little instance. We have in this Home District a tactical society which meets twice a year. We carry on the war-games in this theatre on the Friday night, and they are sometimes followed on the Saturday by going over the same ground and working out the problems on the spot. If you come here on Friday night you will find this place pretty well full. Why? Because it is after business hours, and the Volunteer officer can come here; but the more instructive is the following day—and how many at the outside do we get to go then? Five or six. Here are these men eager to learn, they can come after business hours, but their business will not allow them to

come away on the Saturday morning. Just the same thing applies to all the instruction of the Volunteers. You must not have rigid rules with fixed classes stating when the officers are to come. I am sure Colonel Haywood would agree with me, and I agree with him, that if you put into large centres Regular officers, not to assist the general in staff work or anything of that kind, not to deal with the instruction of the Regular officers, but to be known in the district as the officer always ready at any time—it may be up to 10 or 11 o'clock at night—to hold his class to give instruction to the Volunteer officers, I venture to say that those classes would always be full.

Captain P. F. PILDITCH (1st Sussex Volunteer Artillery) :—There are one or two remarks I should like to make upon the very excellent paper to which we have listened this afternoon. The first is with regard to the schools of instruction, to which Colonel Lonsdale Hale has also referred. I must say that when I heard the remarks of the lecturer upon this point it seemed to me that the theory of being able to start a school of instruction in every district where there may be a certain number of Volunteer officers was more or less in the nature of a counsel of perfection, rather than one which could actually be carried out. I rather gather from what Colonel Lonsdale Hale has said that he has in his mind something of the nature of evening classes, such as the adjutants of artillery regiments at the present time already give; but what I thought the lecturer meant was a regular school of instruction such as we had until recently at Woolwich, and such as we now get at Lydd, and I believe, though I have not had personal experience of it in other parts of the country, further North. It seems to me, with an experience of some years' work in a position battery, that what we want is more elasticity in times in which the schools of instruction, for a week or a fortnight or a month as the case may be, are held. Up till quite recently, I believe, I am right in saying that the schools of instruction at Woolwich have always been held in the spring, and no other time. But within last year a class or a school for a fortnight has been held in the autumn at Lydd, and that has been found, I am given to understand, to be a satisfactory variant upon the schools held in the spring. If it were possible for the Government to start regular schools of this kind, schools where there are instructors as well as guns and men and horses ready to be utilised in action with the work to be done, in various districts of the country, at varying seasons of the year, so that practically at all times there would be a school going on to which a Volunteer officer might go, and if, in addition to that a liberal scale of allowances was given so that no serious pecuniary expense fell upon the officers attending, I think that difficulty would be met. There is another point in the lecture upon which I should like to say a word or two, viz., with regard to the guns. I gather from what the lecturer says that his experience and work have lain principally in a battery or a regiment which has been gunned with heavy guns, and he apparently has not much sympathy with the unfortunate batteries which have been gunned with 16-pounders and which have been drilled for a great many years at a considerable expense of money, labour, and sacrifices of various sorts in the drills which appertain to field artillery. I happen to belong to one of those batteries, which appear to be threatened with extinction. I think it would be very desirable that, instead of having batteries now horsed with four horses per gun and 16-pounder guns merged in the slowly moving position batteries which could only be used for the defensive, as the lecturer has remarked, these batteries should be provided with 15-pounders, which at one time, some 18 months since, the Government stated were to be supplied to them, all the labour and expense that have been incurred for so many years will not have been thrown away, and a valuable force of mobile field artillery useful to act with the other Volunteer arms, will have been saved. Only one

point further. It seems to me that the difficulty, with regard to not only Volunteer Artillery but Volunteering generally, lies in the officer question, and not so much perhaps in the question of teaching the officers you have—although I quite agree with what the lecturer has said, and what so great an authority as Colonel Lonsdale Hale says on the subject—the primary difficulty is the filling up of the number of officers necessary. At the present time, I think I am right in saying that a very large proportion of the Volunteer Artillery batteries are very short of their complement of officers, and find great difficulty in keeping up anything like the numbers they should have. And I take it the new Regulations, which very much increase the number of drills to be done during the winter, and also insist upon the camp (very desirable things in themselves, no doubt), will somewhat increase the difficulty of finding Volunteer officers. I suppose the difficulty in the artillery is partly due to the fact that the men cannot be found in sufficient numbers who have the necessary time for the work; but I think also a greater number of men would be forthcoming if the expenses attached to the preliminary joining of young men could be diminished. I do not mean the ordinary expenses of the officer during the year, the mess and battery expenses, and so on, but the heavy preliminary expenditure in the shape of his uniform. We know that at the present time it costs a young fellow of, say, 20 or 21, who is about to join some £60 or £70 for his uniform, for which he gets £20 back from the Government if he passes his examination within a certain time. We also know, of course, that quite recently there has been a new regulation, which will, to some extent, slightly reduce the cost of the uniform; but I think still the expense of the uniform, amounting as it will to between £40 and £50, acts as a considerable deterrent to a sufficiently large number of officers joining—not only the Volunteer Artillery, but the Volunteers generally. If we could in some way get the Government to still further assist in reducing the cost of the uniform, and also to pay something more towards the cost of what has to be borne, I think we should find a large number of officers would join. Personally, as a Volunteer Artillery officer, I am exceedingly pleased with the paper which Colonel Haywood has read to-day.

Major-General F. C. TREVOR (late R.A.):—As the lecturer refers to the past, I only want to mention one item of ancient history. When, twenty-two years ago, just before I retired from the Regular Army, I had a command of Volunteer and Militia Artillery in two counties, I was very much struck with the intelligence and state of instruction of the Volunteer officers, which compared very favourably indeed with that of the Militia artillery officers, who were also under my command.

Major H. B. TASKER (3rd Kent Volunteer Artillery):—It has been a great pleasure to me to hear this lecture read by my old friend Colonel Haywood. I can vouchsafe for all that Colonel Lonsdale Hale has said with regard to the benefit he has conferred upon the Liverpool and Manchester districts in connection with the tactical societies there. We have known each other a good many years Volunteering when I lived in the North, and that gave me greater pleasure in coming here, although for all that he would not expect me, probably, to agree with everything he says. I certainly do agree in a very large measure with what the paper contains. I feel, and always have felt, that the general training of the officers is a most important thing. It has often occurred to me whether there is not a very simple way of getting more efficient officers than we have. Colonel Lonsdale Hale, if he will allow me to mention it, often tells us Volunteer officers that we must look upon things as business men. We are business men and professional men. There is one thing, however, in Volunteering which I think would be of great benefit to the Service. It is a voluntary Army, and we look upon it

from a business point of view ; but do we as business men promote in our officers the man who has been there the longest, or the man who shows the greatest aptitude and does the best work in that office ? I maintain that the Volunteer force year after year loses an enormous number of officers, keen and good officers, who would make some of the finest Volunteer officers—possibly as fine, if not finer, than any we have now. Why ? They come in as subalterns, they go through their schools of instruction, they pass every examination they are allowed to ; they work their batteries up to a very high state of efficiency, and then when some of their seniors come on—it may be the battery commander (I am a battery commander myself, so that possibly my subalterns have felt the same thing)—the whole battery is knocked to pieces as soon as they come on to the field. There is only one way out of that, unless very strict regulations are made, namely, promotion by qualification. In business we promote by qualification, and why should we not adopt the same principle in a purely voluntary Army ? I think the power of teaching will be found very well developed in Volunteer officers as soon as promotion is principally by qualification. As far as I understand, promotion by qualification is becoming more recognised in the Regular Service, and, if anything, less recognised in the Volunteer Service than it used to be. If promotion was made by qualification it would considerably help the movement forward in regard to filling up vacancies, because we should not lose a lot of young officers, who resign simply because it is very disheartening work. Then, I think, the Volunteer drill season is too long in most corps. In many corps a man has 100 to 150 opportunities of putting in his twelve drills, or whatever number may be necessary for efficiency. For an officer to train his men himself he necessarily ought to be there those 100 or 150 times. It is most disheartening work. If there was a shorter drill season, then the officers and non-commissioned officers would be there, and could impart instruction to their men. When the Volunteers were originally started, I think I am right in saying the Regulations were that every Volunteer had to put in so many drills in the first quarter of the year, so many in the second quarter, so many in the third, and so many in the fourth. That gave us a much more level efficiency than we get now, because so many men leave their efficiency till the very end. The consequence is that each time one goes on parade the whole instruction is kept back because you have a few men who have come up, perhaps, for the first or second time during the drill season. There is a good deal, I think, in what Colonel Haywood said as regards having drill books specially for Volunteers ; but as it is a purely voluntary force, if we in any way try to widen the breach between the Regulars and the Volunteers I think it will lessen the number of our recruits in the Volunteers. Many officers have spoken on that subject before, and that has always been my way of thinking. A year ago, when the Army Estimates were brought out, we were given to understand that there were going to be fifteen batteries of Volunteer Field Artillery. In this year's Estimates I see nothing about them. With regard to the 4·7-inch gun, it is a most excellent gun for position artillery. If Colonel Haywood will allow me to say so, I think there are certain Volunteer corps in the United Kingdom who are capable of being trained as Auxiliary field artillery. They would obtain certain recruits who would not go into position batteries, and it would be a pity, I think, to lose their services. I do not think that Volunteer field artillery could be raised in all large centres, but there are some in which it could be. I should certainly say that fifteen batteries could be thoroughly well trained—I do not mean to say on the present allowances, because we only have enough to go out with the guns horsed four times a year ; and I do not think, however capable Volunteer officers are in regard to teaching, they can make a battery manœuvre properly in four mounted parades. But if we only had allowances somewhat similar to the submarine mining

engineers, as well as our allowances for horses, I am quite sure we should have a very fairly efficient Volunteer field artillery. As regards driving with long reins, and the gunners all up, I think that is a great deal a matter of weight behind the teams. If you want to go at a walk, I think the gunners ought to walk; if you want to trot, then you cannot very well increase the weight behind the teams. It is becoming more general, whenever you do walk, to dismount your detachments and ease the weight as much as possible. That, I think, we have seen in the South African war. The authorities, both in the cavalry and artillery, are considering that as a very important item. My experience of driving is that for anything but position guns driving with long reins would be an absolute impossibility. It might actually do in simple position artillery, but for manœuvring it would be most dangerous and absolutely impossible to carry out.

Lieut.-Colonel R. M. HOLDEN (5th Bn. Worcestershire Regiment):—Not being an artillery officer, it would be presumptuous on my part to attempt to criticise the various points touched upon by Colonel Haywood in his paper; but I may be able to give some information in support of one of his suggestions—that relating to driving from the limbers, which I understand Major Tasker to consider not feasible. From personal experience I can say that on more than one occasion, during the second phase of the war in South Africa, companies of Royal Garrison Artillery have been converted into Provisional Field Batteries. These provisional batteries are armed with 15-pounders, and, to use an Irish expression, are horsed with mules. They are driven with long reins by native drivers seated on the limbers, and using long whips, and all the men are up, except the gun-leaders and trumpeters, who are mounted. I had two guns of this nature under my command—a section of the 31st Company Royal Garrison Artillery.

Colonel LONSDALE HALE:—I should like to ask Colonel Holden whether he has seen any of the eight mules wounded. It occurs to me that when you are driving, one man having control of the eight mules, if one of the mules in the second pair was wounded and restive, the gentleman on the box would have rather a hard time of it; whereas if there was one man driving the centre pair and three riding men on the others your team would be kept more in order. I do not know whether Colonel Holden has seen a driving team in difficulties.

Colonel HOLDEN:—I have seen mules stumble and come down. In such cases the drivers get down at once. If the mule were shot, after disengaging the dead animal, the drivers go on driving just the same, minus the one mule. The system seems to work very well. I do not pretend to much acquaintance with artillery, but I can assure you that these guns moved at a smart pace and freely. They could take up a position quickly, limber up and get away without delay, and change direction without any confusion. The Kaffir boys are very good whips, but what blacks can do white men can, and our garrison gunners were very anxious to learn to drive the teams of eight mules, and were practising when I left. I may mention that guns driven in this manner are employed with many of the mobile columns, and I understand have given satisfaction. One of the speakers has advocated the extension of field artillery in the Volunteers. I believe the authorities have given this question careful consideration, and have come to the conclusion that no great increase in this branch of the Service can be hoped for in a force which cannot reasonably be expected to give the time considered necessary to make them efficient drivers, etc. But I am very glad to see that field artillery has been introduced into the Militia, where more time can be devoted to the subject. I have on three occasions seen the Swiss Field Artillery, and have

always been of the opinion that what is possible with them is equally possible with our Militia, especially when one knows that the force contains so many ex-Army gunners and drivers. A brigade division of Field Artillery Militia was formed in Lancashire last year, and the authorities are so satisfied with the experiment that they are going to extend it. In these circumstances I cannot help thinking that Volunteer Artillery which have a leaning towards Field Artillery would do well to apply to be converted into Militia, where the training is more extended, the opportunities greater, and there are no financial difficulties to contend with.

Colonel B. N. NORTH, C.B. (3rd Bn. K.O. Royal Lancaster Regiment :—I should like to endorse what Colonel Holden has said from my own personal experience in South Africa.

Lieut.-Colonel HAYWOOD, in reply, said :—I am very grateful to everybody for the kindly way I have been treated this afternoon. I have suffered a great deal, because a good many of the things that have been said about me I do not think I deserve, and they have been said in too kindly a spirit. In reading my paper, I said that I had received a letter from Colonel Sir Howard Vincent. In think it would be interesting if I read it, because it goes into some artillery questions, and also refers to something which occurred during his absence in South Africa. He writes :— "I am unfortunately confined to the house to-day. If I can go out to-morrow I must at 3 o'clock wait upon the Secretary of State for War with a deputation he has consented to receive upon the new "Volunteer Regulations," so unexpectedly conceived and fired from Pall Mall during my recent absence in South Africa. I have, however, read your paper with great interest, and should be glad to give expression to my grateful sense that there is one who remembers the three days' Conference we had at my instance 25 years ago in the old Royal United Service Institution upon 'The Requirements of the Volunteer Force.' It led to the appointment of Lord Bury's Committee and a few changes for the better. My resolution in the House of Commons in 1886, which nearly defeated the Government of the day, led to Lord Harris's Committee, further improvements, and an increase in the capitation grant to 35s. But, as you truly say, 'in the main the questions still await answers.' This is not the fault of the Volunteers. The fact though remains, and incredible as it seems, we have almost as much difficulty in 1902, after 40 years of trial and of effort, of progress in the face of opposition, with 300,000 men in the force, and 750,000 at least having passed through it and still under 50 years of age, after we have given 22,000 men—first-rate men—to the field force as Volunteers, and 30,000 as 'Yeomen' and 'Regulars,' as we had in 1862. Our grandchildren will surely say 'they were mad in those days.' An army 1,000,000 strong, active, and ready, costing £1 a head a year, and they held meetings, and high authorities aborted proposals to alter this, and take instead a year out of the life of each British youth? The Volunteer Artillery has been scandalously neglected, on purely theoretical grounds smashed rudely to atoms by the enemy in South Africa. I rejoice that Mr. Secretary Brodrick promises thirty batteries of 4·7 guns before the end of 1902, and I hope thirty more by 1903. The Boers could move and work guns of greater calibre than ours with more common sense and intelligence, and but little of red tape or axiomatic tradition. What they have done the Volunteer Artillery can do, for Transvaal and Orange gunners were nothing but Volunteers with up-to-date instructors. Nor is it alone with the armament of the Volunteer Artillery that the nation has cause for dissatisfaction. True that it is more apparent to us and on the Continent. Nothing in the Artillerie Musée at Berlin of old and obsolete weapons excites more interest than a specimen of your gun. Our new 15-pounder Q.F. gun can throw a 15-lb. shell 6,660 yards. The French and Servian

gun is good at 7,655, the Swedish, Roumanian, and Bulgarian gun at 7,600, and the German, now being improved, at 7,100 with a 16-lb. shell. 1,000 yards less range means that our new batteries would be for that distance under fire without power of reply; and the cavalry and infantry seeing the artillery outranged, and having to advance within the zone to get a shot home becomes demoralised and thinks 'someone has blundered.' What other nations could do we can do. Woolwich Arsenal is, of course, overpressed. But the notion of putting all our eggs into that one basket! There are private inland arsenals wanting work, and they—Vickers, Tirtles, Cammells, Armstrongs, can turn out as good batteries as Woolwich or any British company. But they cannot be fitfully encouraged. If they erect costly plant they must be considerably utilised. This is the policy of the Boulevard St. Germain, and the Königgrätzer Platz, and it is the only sensible one in the event of the pressure arising from war. The result of our system was that the South African demand drove us to the foreign market. And suppose we had been at war with that Continental purveyor! Nothing could have been obtained. Where should we have been?" With regard to the criticisms of the paper, Colonel Lonsdale Hale echoed very highly what I said about instructions. I think the next speaker, Captain Pilditch, a gunner, has not quite understood the drift either of what I aimed at or at what Colonel Lonsdale Hale aimed at. It is not so much the starting this afternoon in this room the details of a system of instruction, but rather to show in what way the system that has gone on in the past has failed. They left the Volunteers to introduce amongst themselves, provided the authorities were complacent, a system which would meet all the objections that Captain Pilditch saw. With regard to the idea of appointing schools, take my own city of Liverpool. We have between 100 and 150 Volunteer Artillery officers there. Surely, it is worth while to have a school for that number of men who are willing to risk their lives and give a great deal of time to the Service, even if it costs a little money! I do not see anything terrible in spending a little money on a school with a staff—not a single man, as Colonel Lonsdale Hale might suggest, in a district, but a regular staff, under the General certainly, but doing that one work for Volunteer officers—taking Volunteer officers when they are young, and teaching them that which they require to know. I am perfectly certain that that would be the secret of filling our ranks; it would also do very much more than all our medals and other things that we get for raising the status of Volunteer officers. No man thinks less of himself for knowing that he knows his work. The man who feels when he goes on parade that there is not a single item he does not understand goes on with confidence; but when a youngster goes on in a corps with a busy adjutant who has a great many other things to do, and he goes in to his drill-hall and is not sure of this, not very sure of that, and not quite sure which way the saddlery goes on, and that sort of thing, he shows a little hesitation and begins to depend upon somebody else; and that somebody else gets too superior an idea of his own position—generally a non-commissioned officer. That undermines his career; at any rate, until he learns better, his career is checked. He has lost confidence; therefore, he cannot impart it to others. My experience has been that we should spend a long time in getting hold of the youngsters, out of the sight of those whom they will subsequently teach, and teach them before they go on parade. They will put their forage caps very much over one ear, but the non-commissioned officer does not laugh at them all the same. Major-General Trevor's remark about the Volunteer and the Militia are very interesting; but I rather sympathise with the Militia; they do not have very many opportunities; until this war they were a fearfully neglected body. They have very good reason to thank the war for bringing them very much to the

front ; and we must take care that *we* are not neglected now. Major Tasker, a very old friend of mine, and also a very old critic—this is not the first time we have criticised each other—spoke about the idea of promotion by qualification. Just a little later on he said that he did not very much like the idea of a Volunteer drill book, because it rather differentiated Volunteers from Regulars. Well, in the first part of his speech he suggested something that would very much differentiate Volunteers from Regulars. I should not like to lay it down that it is understood that promotion is by qualification, because I believe with a proper system of education the indifferent man would be fired out before ever a question of promotion arose. He would never get any chance of promotion : if he was not efficient, out he would go. Therefore, you would still have promotion by seniority, only the seniors would know at any rate as much as their juniors. In the Volunteer Force we seem to be passing through a time when a great number of the seniors always know a little bit less than the juniors ; they feel a bit rusty. I think that the regulations at Aldershot try to overcome that by selecting field officers for periodical examinations. I believe that Volunteer officers might, and would, willingly submit themselves to periodical examinations to keep themselves efficient, if they could do it in a way in which they did not come before the public. If we had schools of instruction for majors, or for any other rank, at certain periods, I do not see why the officers should not be called upon to attend. The same instructors can do the whole thing. As regards what Colonel Holden said, my own instinct has told me that it is true as regards the movable artillery with which I am dealing more particularly, because these fifteen light batteries, which are still very necessary, should belong to the Imperial Yeomanry. I am afraid the question I suggested in regard to the Imperial Yeomanry in my paper, that it is now entirely differentiated from the Volunteer force, was not clear. It is a voluntary organisation in a sort of way, and I think these fifteen batteries may yet go under the same system as the Imperial Yeomanry. All that Major Tasker said about them would be quite right. They would get more money, they would get paid, they would be on the same basis as the submarine miners, and they would then be a force, which, after 50 or 100 periods of drill in the year (of driving drill) would be very useful. I am dealing now with the movable artillery, which would be used for long marches, mostly at a walk to get from one place to another, not necessarily with infantry, but to go into positions of defence. With regard to longer distances, we Volunteer Artillery ourselves have frequently gone 15 or 20 miles a day. I am speaking of those poor beggars that have hold of the reins of a great heavy horse, so that their arms are nearly pulled off ; they are the civilian drivers. These poor fellows do very well ; but I believe that if we instituted the other system we could get our own drivers, pick them up from Pickford's and that class of men. We have plenty of men in Liverpool who could do everything we require. Colonel Holden and another gentleman, both from the front, supported what I said about it being practical. I have never been allowed to try it, and I was rather curious to know if anybody had. I am much obliged to you for the kind way in which you have listened to the paper.

The CHAIRMAN (The Earl of Stradbroke) :—I am sure you would all like to accord a vote of thanks to Colonel Haywood for the very interesting paper which he has just read to us, and also for the way in which he has replied to the discussion. I think we must all feel that there has not been a time in which the improvement of the Volunteers has been more deeply thought about by the general public. Everybody feels now that there is nothing between general service and the Volunteer force. There are a good many requirements which we think are necessary for the Volunteers, and now is the

time to press them on the authorities. We know from our own experience that if we go to the War Office and ask for anything, they often say they cannot grant it, although they would like to, because they are dependent on the Treasury. That really means that the taxpayer will not come forward and give the necessary sums of money that are required to make the Army in all its branches thoroughly efficient. I think it is clear that the new regulations which have just been published aim at making the Volunteer force more efficient. It is quite evident that the authorities are convinced that it is more desirable to have a limited force that is thoroughly efficient rather than an unlimited force containing a certain number of men who are not up to the proper standard. Those requirements, although they may be rather difficult to fulfil, are not really more than are necessary to make the Volunteers thoroughly efficient. We all feel how very desirable it is to get our men into camp, and that if we can keep them there for six days it will be an excellent thing. But we must not hide from ourselves or from the public the very great sacrifices men are asked to make to fulfil those conditions. Especially I would take the case of recruits joining this year in those corps who propose to go into camp at Whitsuntide. They are asked to attend no less than sixty drills before that time, which means practically three drills a week. That is alone a great sacrifice for a working-man to make. Then, again, if he goes into camp, in a great many cases he makes a considerable sacrifice in losing his pay during that time, which especially bears heavily on married men, who have to keep their homes going all the time they are in camp. I think the public ought to bear this in mind—that the Volunteers are asked to make very heavy sacrifices in fulfilling the new requirements which the War Office think necessary for the Volunteers to carry out. Colonel Haywood has brought several matters before us this afternoon in which I think, as a rule, we agree. He has referred to the desirability of having a uniformity of drill. I think that would be a very excellent thing, because we know that Volunteers very often have to leave the town in which they are living and go to some other place without, perhaps, having been able to make themselves efficient before they leave. It would be a great help to them if, when they are attached to another corps in the new place where they have taken up their abode, they could make themselves efficient with that corps, using the same drill book to which they have been accustomed. With regard to what has been said as to making the officers more efficient, I think what Colonel Lonsdale Hale said is very important. Colonel Haywood referred to the fact that in Liverpool there are no less than 200 Volunteer artillery officers. In a place like that it would be easy to form a school of instruction which would be well attended; but there are also a great number of Volunteer artillery officers in the country districts, and it would be very difficult to get a number of such men to come together often. But if, as has been suggested by Colonel Lonsdale Hale, there was some officer in each district who could make it his business to attend the various stations during the year, to meet the convenience of those officers, I think very valuable instruction could be given to them, without entailing any expense on those Volunteer officers. With regard to the gun, I myself am strongly of opinion that the 4·7-inch is the most useful gun for Volunteers to have. Major Tasker referred to the fact that many batteries of 15-pounders would be useful and would be well manned in many places, but my experience was that the four drills for which we receive money to horse the batteries were not sufficient to make the men thoroughly efficient to enable them to go into the first line in case of emergency. I am glad to say my batteries have received some of the 4·7-inch guns already, so that the men will be able to make themselves thoroughly efficient, and if called upon they will be able to go right up to the first line at once. That, I think, is what the authorities want. I only hope they will be liberal in the

allowances. The old allowance of £100 a battery never covered the expense of horsing the battery, even the few times they went out in the year. With regard to driving, I am sure we all listened with great interest to the remarks of Colonel Holden, who has had experience in actual warfare with guns being driven. Perhaps it might be objected to by some Volunteers, because it would not look smart, but we know now that what we must do is to make the men thoroughly efficient and serviceable in every way, and the chief objection to driving seems to me to be that if the driver were disabled, the whole team would be thrown into confusion. For all we know, before very long another form of traction may be introduced for moving guns—I mean steam traction. I believe it is used a great deal abroad, and it is not improbable, I think, that it will be introduced into this country before very long for moving heavy guns and for moving our transport throughout the country. But in all these matters we want to be thoroughly prepared. Whatever our traction is to be, whether by horse or by steam power, we must be prepared and have things ready so that we shall never find ourselves again in the position in which we felt ourselves to be in December, 1899. It is perfectly true that there is no lack of spirit—there never has been—or any lack of patriotism. We have nothing to fear on that score. The men are always willing, and we are all of us perfectly ready and anxious to do our best; but we must have felt at that time that there was a lack of trained men. That is what we want to avoid. We all want to impress on the general public that they must do everything they can to help the Volunteers, and they must not grumble if the Volunteers ask for greater assistance from the War Office to make themselves efficient. I ask you to join with me in giving a hearty vote of thanks to Colonel Haywood for the interesting paper he has read this afternoon.

Major-General STERLING :—As an old member of the Council of the Institution, it has been entrusted to me to propose a vote of thanks to the Chairman for his presence here this afternoon. Of course, it would have been perfectly easy to find an officer of the Regular forces, either active or retired, who would have been willing to come and take the Chair on this interesting occasion, but it is much more important for the value of the subject that it should be brought forward in a proper and suitable frame. That an officer of experience, such as Lord Stradbroke is in his own particular branch, should have come and assisted the meeting by taking the Chair, is of great value; and I think he deserves the thanks, not only of the Institution, but of his audience. In the name of the audience I beg to return to his Lordship their sincere thanks for his presence here this afternoon.

The CHAIRMAN :—I am very much obliged to you for passing this vote of thanks. I am very glad to be here to-day to meet many old friends, whom I have met in connection with Volunteering over and over again.

A GERMAN VIEW OF BRITISH TACTICS IN THE BOER WAR.

How far the Tactics and Peace-Training of the British Army conduced to the Failures in S. Africa.

Précis from the "Jahrbücher für die Deutsche Armee und Marine."

By Lieut.-Colonel E. GUNTER.

N.B.—For brevity, I.D. stands for Infantry Drill, 1896. S. for section. ss. for sub-section.

Since this *précis* was made, the provisional "Infantry Training" has been issued, showing how far our own Authorities' views agree with German criticism.—Tr.

IN the engagements of the first period of the Boer War the peace-training of the British troops, based on their Drill Book, and taking no account of the experience already gained in that war, led to frequent repetitions of the same procedure which resulted in failure.

These tactics are to be attributed to the British having in framing their regulations paid too little attention to the experience of recent wars on a large scale, and to the teachings of science, especially as regards ballistics, and to the fact that even where their regulations were unobjectionable, they were not skilfully carried out. In a word, their failures were attributable to their faulty peace-training.

The existing English "Infantry Drill" of 1896 is in many respects similar to that of the German Army, and is a very clever *précis* of tactical and technical military principles. It contains, however, some views and precepts which, owing partly to their direct influence and partly to their one-sided or narrow-minded comprehension by leaders, must certainly share the blame of the failures.

In almost all the actions of the first period of the war the British approached the enemy in such deep formations that they suffered enormous loss. Now, I.D. S. 124 (5) advises no more extension than necessary. "Extension is only to be commenced when the hostile fire makes advance in closed bodies impracticable," and also that "it will often[1] be possible to advance to within 800 yards without extension,"

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[1] This is a mistranslation by the author—the section quoted says *occasionally*; moreover the remainder of the sentence, which the author does *not* give, discounts this.—Tr.

thus putting prominently forward the advantage of close formations. The author also, quoting from the rules for manœuvres, says, "troops when under well-conducted, effective fire are not to approach nearer the enemy's position than 800 yards in close formation." (This paragraph was, however, altered in the "Rules" published in July, 1899, to 1,500 yards, and the distance at which bodies can only move directly to the front or rear, which the author condemns as too close (700 yards), was altered to 1,000 yards.)

He says the above shows the tendency towards close formations, and that, moreover, the rules for savage warfare in the Drill Book order close formations to be adhered to whenever possible. "The regulations were more framed with regard to the increasing wars in India and Africa, and so close formations were much more practised than skirmishing, which entails much greater trouble and higher intelligence."

Perhaps the British thought at first the Boers *were* half savages. They suffered the same experience as the Germans against the troops of the French Empire in 1870, only the Boers were far superior to the French in weapons and their use.

This massing of the troops is also influenced by the fact of the battalion being much more the tactical unit than in the German Army.[1] And the Line formations advancing and retiring in line, etc., are much more constantly practised in battalion drill. The directions for the calculation of frontage on the principle that it shall not exceed in attack that of the line in close order, so that a brigade extended only covers 585 yards, and in defence five men per pace are required, have the same tendency.

A second fault is the insufficient preparation of the attack by fire. The directions for carrying out the assault and for counter-attack show that the authorities have not yet been able to shake off the tendency to shock tactics.

The regulations prescribe 3,000 yards as the limit of artillery range. The British artillery were, however, soon forced to open fire at much greater range, but, owing to want of practice, with very little effect.

The English are still adherents of volley firing, which we Germans have given up years ago. They only permit individual and independent fire when within 500 yards. The rule is to fire section volleys. The want of careful individual training and the anxiety to pull his trigger the moment the word is given result in each man's firing without taking exact aim. Only one-fourth (one section) or at most half of each company is to be extended.

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[1] This is now to be remedied.—TR.

The English open fire too late. The regulations say, as a rule, fire will not be opened in attack till the troops reach medium range, and that the troops should try and get as near the enemy as possible before opening fire, this precept being repeated in the instructions for company drill. The advance by rushes is described, and the author says it is expected that by the time a distance of 500 yards from the position is reached, so great an effect will have been produced by the preparatory and decisive fire, that real and false attacks will be able to be made upon the position as from a siege-parallel. But still the enemy's defeat is not completed till 300 yards from the position, for from that distance, bayonets having been fixed, magazine fire (five rounds) is to be opened.

These directions must inevitably train the troops to too great delay in opening fire, and to devote too short a time and too few rifles to the preparatory fire.

The effect of the distribution of the attacking force by depth also makes itself felt. The English regulations leave the whole fire-fight, that is the main task, the establishment of superiority of fire, to the first line, and does not allow the second line to take any part in it[1] until the moment for the assault comes, which if superiority of fire has been well established, is comparatively easy work. The second line is required to be closed upon the first the moment the latter has established thorough superiority of fire, and to carry the first line by its impulse forward with it to storm the breach.

Now, this is a work of art. How is the second line to judge exactly when it is to press forward? If it is too late the first line may be destroyed and the fight have to be begun anew. If too soon, then it may force the fighting and oblige the first line to intermingle with it. The defender, not yet sufficiently shaken, will repulse the thickened line with bloody loss.

The attack being thus conducted on the parade grounds, it is but natural that the energies of the first line should diminish with each succeeding drill, and the heavy assault with beat of drum, blast of bugle, and loud hurrah, become more and more the main business, especially with the hurry-scurry that always characterises sham-fights. Hence, the main thing in attack becomes the rush to the assault, not the preparation by fire.

The engagements in South Africa took this course. The British troops run in close formations into the effective fire range of the Boers, suffer great loss, and then begin their fire-fight. The second line advances after very inadequate preparation, undertakes the assault with

[1] This is not quite correct, as I.D. S. 111 (2) permits the second line to *reinforce* the first at any time required.—TR.

portions of the first line, and is repulsed with heavy loss by the still unshaken defenders.

Buller's, Methuen's, and Gatacre's actions took this form. General Symons tried three times in vain to force the enemy's position at Glencoe by frontal attack. On 23rd February, General Buller let the 2nd and 5th Brigades in succession make frontal attacks against Pieter's Hill and Grobler's Kloof, though this had been unsuccessfully attempted by the 11th Brigade the day before.

The writer then criticises I.D. S. 124 (4), by which the third line is directed to take up a defensive position to rally on in case of reverse, remarking that the German regulations prescribe that, when required, the last reserve is to be engaged. He also says that the same measure of over-caution characterises the instructions for the defence, the commander being required to keep a reserve in hand to be employed for counter-attack or to cover the retreat, whereas the Germans say it should be used to carry out the fight itself. The result of this is, he remarks, that the troops are only partially employed and failures in detail occur, which, bringing the whole into action, would obviate, *e.g.*, at Spion Kop, at the decisive moment, only 4,000 men of Woodgate's Brigade were made use of, while 3,600 remained inactive. At Magersfontein the Highland Brigade, supported by a portion only of the Guards, had to bear the whole burden of the fight, while the other portion and the 9th Brigade took no part in the action.

The writer criticises the British quick advance and the method of attack by short rushes of 40 to 50 yards, whereas the Germans prefer those from 80 to 100 long. The advantages of short rushes are less fatigue, shorter exposure to the defender's aim, and less interruption of fire. On the other hand, the more often repeated exposure of the men at the moment of rising to rush forward causes greater loss in the end. The moral effect of the larger number rushing forward less frequently is greater.[1]

Against good snap-shots like the Boers the device of quick, short rushes were ineffectual.

The writer criticises also the instruction "*firing as they go*" of I.D. S. 115 (2), saying that firing while advancing to the assault has been done away with in the German Infantry Drill; that such firing is quite useless against an enemy who offers no more at most than a head and shoulders to aim at.

The British troops were far inferior to the Boer in their knowledge of the use of ground. Mostly recruited from the towns, this was

[1] According to a German eye-witness, the British rushes were too *long*, as giving time for defender's aim.—TR.

unknown to them, and in their peace training they were not instructed in this. The Drill Book makes occasional mention of it, but does not say how it is to be done.[1] It, therefore, happened in the first part of the campaign that officers and men alike despised the use of cover. To the preparation for battle as regards training the men to judge ground and distances, the exigencies of the fight, fire discipline, and skilful use of weapons, which demand a high order of knowledge and capacity as well as considerable mental activity on the part of instructing officers, very little time or zeal had been devoted, and, even where this was occasionally done, more attention was paid to practising effective battle-pictures, without taking into account their practical accordance with real war.

In no modern Army does "drill" flourish as in the British. We see everywhere the most exaggerated stress laid on uniformity and simultaneous action. Their ideal is to get movements done so that they look well and the "now all together" principle rules supreme. We see that even in their musketry instruction and shooting. Stiffness and uniformity characterised the performance of the individual skirmisher as well as the collective action of small bodies or of detachments. The Infantry Drill of 1896, brought out under the auspices of the highly-gifted and honoured Lord Wolseley, certainly indicated progress in recognising the higher value of the spirit of things as compared with mere form. But the training of the troops was still entrusted to the men of tradition. These could not bring themselves to believe that the practices they had (with more or less success) taught before the introduction of the new drill had suddenly become useless or at least of minor importance. This and the trouble of striking out new paths for themselves were obstacles to the penetration of the proper spirit of the new regulations. Therefore, though they adopted the minor changes in form which these introduced, they retained, essentially, their old methods of training. Even Lord Wolseley's inspections, to the disappointment of some progressive officers, were modelled on the old type.

The antiquated system of training of the British Army is partly owing to the troops not being allowed to go off the roads while exercising, unless the landowner especially gives permission for this in each case. Their training was, therefore, that of the parade ground, which made instruction in the use of ground impracticable. When, therefore, they took part in manœuvres on a large scale, as near Aldershot and on Salisbury Plain, though there was ample room and variety of ground, they did not take advantage of this, because they had never had individual practice in this, nor had they even when working in small bodies been accustomed to it.

[1] The writer has apparently overlooked I.D. S. 47 (5).—TR.

The above-named manœuvre grounds themselves, though certainly large enough and suitable for the technical training of bodies of troops of all arms, are not sufficient for the technical training of officers and for practising the combats of opposing forces of all arms. The nature of the ground and its various obstacles, irregularities, its cover, distances, etc., become in a short time so thoroughly known to all the officers engaged that they only learn the tactics suitable to that particular locality. For real tactical training and for the essential practice in reconnaissance it is necessary to work over ground that is continually changing, so that, from its nature, fresh problems may always present themselves for solution.

PEACE STRENGTH OF THE RUSSIAN ARMY, JANUARY, 1902.

I.—St. Petersburg Military District.

a. Guard Army Corps.
38 battalions, 41 squadrons, 9 sotnias, 86 guns, 2 parks.

b. 1st Army Corps.
38 battalions, 56 guns, 2 parks.

c. 18th Army Corps.
32 battalions, 56 guns, 2 parks.

Troops outside Army Corps totals:—
Artillery: 24 guns, 1 park.
Engineers: 5 battalions, 2 companies, 1 command, 1 cadre.
Local Commands: 3 battalions, 16 companies.
Reserve Artillery: 2 guns.
Fortress Artillery: 6 battalions, 1 company.

Grand total St. Petersburg Military District:—
122 battalions.
224 field guns (including 6 just back from China not above accounted for).
8 parks.
17 commands.
3 companies.
9 sotnias.
Besides 2 companies, 1 squadron, 12 guns, 1 park, infantry, cavalry, and artillery officers' schools and institutions.

II.—Finland Military District.

Although the Finnish Military District is under re-organisation, the new strength will not be much below last year's effective, which was:—
23 battalions.
7 squadrons.
2 sotnias.
16 field guns.
2 companies.
1 park.
32 cadres.

III.—Vilna Military District.

a. 2nd Army Corps.
32 battalions, 18 squadrons, 6 sotnias, 148 field guns, 3 parks.

b. 3rd Army Corps.
32 battalions, 18 squadrons, 6 sotnias, 124 field guns, 2 guns.

c. 4th Army Corps.
32 battalions, 88 field guns, 2 parks.

d. 16th Army Corps.
32 battalions, 12 squadrons, 88 guns, 2 parks.

e. 20th Army Corps.
32 battalions, 56 guns, 2 parks.

Troops not included in Army Corps formation :—
Infantry : 9 battalions.
Cavalry : 1 squadron.
Artillery : 24 field guns, 1 park.
Engineers : 9¼ battalions, 3 companies, 1 command, 1 park, 1 fortress telegraph, and 1 balloon section.
Fortress Infantry : 9 battalions.
Reserve Artillery : 24 guns, 1 park.
Fortress Artillery : 8 battalions.
Siege Artillery Battalion : 1 battalion.
Foot and Reserve Batteries : 10 guns.

Grand total Vilna Military District :—
196¼ battalions.
49 squadrons.
562 field guns.
14 parks.
3 companies.
1 command.
1 fortress telegraph section.
1 fortress balloon section.
12 sotnias.

Besides the under officers' school battalion, the military pigeon lofts, and the Bobruisk disciplinary battalion.

IV.—Warsaw Military District.

a. Guard Corps.
16 battalions, 72 field guns, 1 park.

b. 5th Army Corps.
32 battalions, 18 squadrons, 6 sotnias, 172 field guns, 4 parks.

c. 6th Army Corps.
32 battalions, 18 squadrons, 6 sotnias, 124 field guns, 2 parks.
d. 14th Army Corps.
32 battalions, 24 sotnias, 124 field guns, 2 parks.
e. 15th Army Corps.
32 battalions, 18 squadrons, 6 sotnias, 124 field guns, 2 parks.
f. 19 Army Corps.
36 battalions, 18 squadrons, 6 sotnias, 124 field guns, 2 parks.
g. 1st Cavalry Corps.
36 squadrons, 12 sotnias, 12 field guns.
h. 2nd Cavalry Corps.
42 squadrons, 6 sotnias, 12 field guns.

Troops not included in Army Corps formations :—
Infantry : 18 battalions.
Cavalry : 1 squadron, 2 sotnias.
Artillery : 24 guns, 1 park.
Engineers : 8 battalions, 7 companies, 4 commands, 1 park, 5 fortress telegraph sections, 5 balloon sections.
Reserve Brigade : 24 battalions.
Reserve Artillery : 8 guns.
Fortress Infantry : 31 battalions.
Fortress Artillery : 23 battalions.
Siege Artillery : 1 battalion.
Fortress Batteries : 12 guns.

Grand total Warsaw Military District :—
285 battalions.
151 squadrons.
814 field guns.
15 parks.
7 companies.
5 commands.
5 fortress telegraph sections.
5 balloon sections.
68 sotnias.

V.—Kieff Military District.

a. 9th Army Corps.
32 battalions, 18 squadrons, 6 sotnias, 68 field guns, 2 parks.
b. 10th Army Corps.
36 battalions, 18 squadrons, 6 sotnias, 68 field guns, 2 parks.
c. 11th Army Corps.
32 battalions, 18 squadrons, 6 sotnias, 124 field guns, 2 parks.

d. 12th Army Corps.

32 battalions, 18 squadrons, 4 sotnias, 148 field guns parks.

e. 21st Army Corps.

32 battalions, 56 guns, 2 parks.

Troops not included in Army Corps formation :—

Infantry : 10 battalions.
Cavalry : 24 sotnias, 1 squadron.
Artillery : 48 guns, 1 park.
Engineers : 7 battalions, 1 park, 1 command.
Cadres Cavalry Reserve : 6 detachments.
Reserve Artillery : 24 guns, 1 park.
Fortress Artillery : 1 company.
Siege Artillery : 1 battalion, 4 guns.
Local Commands : 1 command.

N.B.—Add 7 engineer battalions and companies, 4 pontoon battalions, now returned from Kwan-tung, not above described.

Grand total, Kieff Military District :—

$181\frac{3}{4}$ battalions.
73 squadrons.
6 detached cadres cavalry (reserve).
540 field guns.
14 parks.
1 company.
2 commands.
46 sotnias.

VI.—Odessa Military District.

a. 7th Army Corps.

36 battalions, 6 sotnias, 80 field guns, 2 parks.

b. 8th Army Corps.

36 battalions, 18 squadrons, 6 sotnias, 92 field guns, 3 parks.

Troops not included in Army Corps formation :—

Infantry : 8 battalions.
Cavalry : 3 squadrons.
Artillery : 12 field guns, 1 park.
Engineers : 3 battalions, 4 companies, 1 command, 1 park.
Fortress infantry battalions : 2 battalions.
Fortress Artillery : 6 battalions, 1 company.
Cadres Cavalry (reserve) : 6 detachments.
Reserve Artillery : 20 field guns, 1 park.
Local Artillery Commands : 1 command.
Local Odessa Command : 1 command.

Grand total Odessa Military District:—

91 battalions.
21 squadrons.
6 detached cadres cavalry (reserve).
204 field guns.
8 parks.
5 companies.
3 commands.
12 sotnias.

And (not above mentioned) the Kherson disciplinary battalion.

VII.—Moscow Military District.

a. Grenadier Corps.

56 battalions, 18 squadrons, 6 sotnias, 96 field guns, 3 parks.

b. 13th Army Corps.

32 battalions, 56 field guns, 2 parks.

c. 16th Army Corps.

40 battalions, 12 squadrons, 56 field guns, 2 parks.

Troops not included in Army Corps formation:—

Artillery: 24 field guns, 1 park.
Engineers: 5 battalions, 2 companies, 1 park.
Cossack troops: 1 sotnia.
Cadres Cavalry (reserve): 43 detached cadres.
Reserve Artillery: 44 field guns, 2 parks.
Reserve Artillery (detached): 14 field guns.
Local Artillery Commands: 1 command.

Grand total Moscow Military District:—

132½ battalions.
30 squadrons.
43 detached cavalry cadres.
200 field guns.
11 parks.
1 command.
7 sotnias.

Besides (in the Tambov local brigade): the Voronesh disciplinary battalion.

VIII.—Kazan Military District.

Reserve Infantry Brigades: 20 battalions.
Local Brigades: 1 battalion, 35 commands.
Local commands (extra): 9 companies.
Cadres Cavalry Reserve: 6 detached cadres.

Reserve Artillery: 26 field guns, 1 park.
Reserve Artillery (detached): 8 field guns.
Cossack Forces: 2 sotnias.
Orenberg Cossacks and Horse Artillery: 2 sotnias, 6 guns, and 3 commands.
Oural Cossacks Force: 1 sotnia, 2 commands.

Grand total Kazan Military District:—

Regulars:—
21 battalions.
28 field guns.
1 park.
44 commands.
6 detached cadres, cavalry (reserve)

Cossacks:—
5 sotnias.
6 field guns.
5 commands.

IX.—Caucasus Military District.

1st Caucasus Army Corps.
34 battalions, 48 sotnias, 96 field guns, 2 parks.
2nd Caucasus Army Corps.
40 battalions, 18 squadrons, 14 sotnias, 68 field guns, and 3 parks.

Troops not included in Army Corps formation:—
Reserve Infantry Brigades: 24 battalions.
Field Gendarmes: 1 squadron.
Artillery: 12 guns, 1 park.
Engineers: 2 battalions, 3 companies, 3 commands, 1 park.
Local Brigades: 3 battalions, 21 companies.
Fortress Infantry: 3 battalions.
Cadres Cavalry (reserve): 3 detached cadres.
Reserve Artillery: 28 field guns, 1 park.
Reserve Artillery (detached): 4 guns.
Fortress Artillery: 6 battalions, 1 company.
Siege Artillery: 1 battalion.
Local Artillery Command: 1 command.
Cossacks and Irregulars; 6 sotnias, 11 cadres, 4 battalions, 8 guns, 4 commands.
Terek Cossacks: 6 sotnias, 8 guns.
Militia: 12 horse sotnias.

Grand total Caucasus Military District :—

Regulars :—

111 battalions.
19 squadrons.
8 sotnias.
3 detached cavalry cadres.
196 field guns.
8 parks.
25 commands.
4 companies.

Cossacks and Irregulars :—

6 infantry battalions.
78 horse sotnias.
28 field guns.
10 cadres 2nd Ban.
4 commands.

And (not above mentioned) the Ekaterinodar disciplinary battalion.

X.—Turkestân Military District.

1st Turkestân Army Corps.

21 battalions (including the 8th Turk Rifle Brigade of 4 battalions, now nearly formed), 20 sotnias, 56 field guns, 5 commands.

2nd Turkestân Army Corps.

17 battalions (including Krasnorodsk reserve battalion), 16 sotnias, 38 guns, 1 company.

Troops not included in Army Corps formation :—

Infantry : 4 battalions.
Artillery : 18 field guns.
Detached Railway Battalions : 2 battalions.
Cossack Forces : 12 sotnias.
Fortress Artillery : 4 companies.
Local Artillery Commands : 1 command.
Engineers : 1 company, 1 command.

Grand total, Turkestan Military District :—

Regulars :—

44 battalions.
100 field guns.
6 companies.
7 commands.

Cossacks :—
48 sotnias.
12 field guns.

XI.—Siberian Military District.

3rd Siberian Army Corps.
¾ battalion, 24 sotnias, 22 field guns.

Troops not included in Army Corps formation :—
1 West Siberian Rifle Battalion.
Omsk Local Brigades: 3 battalions, 26 commands.
Irkutsk Local Brigades: 2 battalions, 16 commands.
Other Local Commands: 3 battalions, 4 commands.
Local Artillery Commands: 1 command.
Cossack Force: 8 sotnias.

Grand total Siberian Military District :—

Regulars :—
9 battalions.
47 commands.
16 field guns.

Cossacks :—
32 sotnias.
6 field guns.

Besides the Omsk, and Irkutsk, in all two disciplinary companies.

XII.—Pri-Amoor Military District.

1st Siberian Army Corps.
25 battalions, 14 squadrons and sotnias, 1 company, 72 field guns.

2nd Siberian Army Corps.
17 battalions, 27 sotnias, 66 field guns, 1 company, 8 machine-gun batteries.

Troops not included in Army Corps formation :—
Infantry: 8 battalions.
Cavalry: 4 squadrons.
Artillery: 6 field guns, 8 machine-gun batteries, 2 parks.
Engineers: 2 battalions, 4 companies, 1 telegraph section.
Reserve Battalions: 4 battalions.
Local Commands: 6 companies.
Fortress Infantry: 7 battalions.

Fortress Artillery: 2 battalions, 1 company, 1 command.
Cossack Forces: 6 sotnias, 6 guns.
Oossoori Cossacks: 2 sotnias.

Grand total Pri-Amoor Military District :—

Regulars :—
64 battalions.
6 squadrons.
132 field guns.
16 machine gun batteries.
7 companies.
2 parks.
7 commands.
1 telegraph section.

Cossacks :—
47 horse sotnias.
12 field guns.

XIII.—KWAN-TÛNG PENINSULAR CIRCUMSCRIPTION

Cossack Forces: 6 sotnias.
Fortress Infantry: 4 battalions.
Artillery: 24 field guns.
Engineers: 1 company.
Fortress Artillery: 2 battalions.

Grand total Kwan-tûng Peninsular Circumscription :—

Regulars :—
6 battalions.
24 field guns.
1 company.

Cossacks :—
6 sotnias.

XIV.—THE DON ARMY CIRCUMSCRIPTION.

Cossack Forces: 5 sotnias, 10 commands.
Reserve Detached Artillery: 8 field guns.

NAVAL NOTES.

HOME.—The following are the principal appointments which have been made: Captains—F. R. Morgan to "Doris"; A. Y. Moggridge to "Hermione"; W. L. Grant to "Monarch"; W. B. Fisher, C.B., to "Royal Sovereign"; G. A. Giffard to "Hannibal"; H. Lyon to "Retribution"; A. M. Farquhar to "Renown"; D. Beatty, D.S.O., to "Juno"; F. Finnis to "Cambrian," as Commodore 2nd Class in command of South-East Coast of America station. Commanders—W. P. Dawson to "Penguin"; H. Jones to "Pomone"; "H. T. Hibbert to "Fantome."

Admiral Sir Compton E. Domvile, K.C.B., the new Commander-in-Chief in the Mediterranean, arrived at Malta on the 2nd inst. from Genoa in his flag-ship, the new first-class battle-ship "Bulwark," and assumed command of the station; Admiral Sir J. Fisher, K.C.B., left for Genoa the same evening in the "Renown," where he struck his flag, returning to England overland. Rear-Admiral G. Atkinson-Willes hoisted his flag on board the "Resolution" at Devonport on the 8th ult., as Second-in-Command of the Home Squadron. The new first-class battle-ship "London" was commissioned on the 6th inst. at Portsmouth for service in the Mediterranean; she is not to leave for her station until after the Coronation Review, during which she will fly the flag of Admiral Sir C. Hotham, G.C.V.O., K.C.B., Commander-in-Chief at Portsmouth. The new first-class cruiser "Ariadne" commissioned at Portsmouth on the 5th inst., for service as flag-ship of Vice-Admiral L. Douglas, the new Commander-in-Chief of the North American and West Indian station, who hoisted his flag the same day on board her; Vice-Admiral Douglas will not leave for North America until after the Coronation Review, in which his flag-ship will take part. The new first-class armoured cruiser "Aboukir" left Portsmouth on the 2nd ult. for the Mediterranean. The new first-class battle-ship "Vengeance" left Portsmouth on the 5th ult. for the Mediterranean. The new first-class armoured cruiser "Sutlej" commissioned at Chatham on the 6th ult. for service with the Channel Squadron, where she takes the place of the "Diadem"; she left Chatham on the 21st ult., and is carrying out some trials before joining the Squadron for the Review. The first-class cruiser "Theseus" arrived at Plymouth from the Mediterranean on the 6th ult., and paid off at Chatham on the 28th ult. The third-class battle-ship "Rupert" arrived at Plymouth from the Mediterranean on the 6th ult., and is to pay off at Devonport. The second-class cruiser "Hermione" is to commission at Malta, where she has been undergoing repairs and refit since her return from China, for service in the Mediterranean. The second-class cruiser "Astræa" arrived at Plymouth on the 14th ult. from China, and will pay off at Chatham. The first-class battle-ship "Royal Oak" arrived at Plymouth on the 15th ult. from the Mediterranean, and paid off at Portsmouth on the 5th inst., where she is to receive casemates for her 6-inch guns, after which the crew of the "Anson" will turn over to her. The sloop "Icarus" arrived on the 15th ult., at Chatham from the Pacific, and will pay off at that port. The armoured cruiser "Warspite" arrived at Plymouth on the 28th ult. from the Pacific, where she has been relieved as flag-ship by the "Grafton," and will pay off at Chatham. The third-class battle-ship "Dreadnought" is to take the place of the torpedo-ram "Polyphemus" as tender to the torpedo-school ship "Defiance" at Devonport, for instructional purposes with submerged torpedo-tubes.

Steam Trials.—The new first-class armoured cruiser "Leviathan," built, armoured, and engined by Messrs. John Brown & Co., anchored at Spithead, has successfully concluded her steam trials. On 13th and 14th May she ran her 30 hours' trial at one-fifth her power, when she drew 26 feet 1 inch forward and 26 feet 6 inches aft,

and she had a steam pressure of 200 lbs. to the square inch in the boilers. The vacuum was 26 inches starboard and 25 inches port, and the revolutions 70·6 starboard and 70·9 port. The collective I.H.P. was 6,372, being 3,182 starboard and 3,190 port. The speed was 15·238, which was the mean of four runs over the measured mile, and the coal consumption was 1·76 lbs. per unit of power per hour. She left Spithead on 15th May for her two more important trials, which were mainly carried out on the measured course on the coast of Cornwall. At her four-fifths power trial she drew 26 feet 2½ inches forward and 26 feet 3 inches aft, and had 245 lbs. of steam in her boilers, with an even vacuum of 26 inches on both sides. The revolutions were 107·3 starboard and 107 port, and the collective I.H.P. 22,882, being 11,584 starboard and 11,298 port. There was no air pressure, and the speed was 21·96 knots, with a coal consumption of 1·75 lbs. per unit of power per hour. On 19th May she left Plymouth for her 8 hours' full-power trial, when she drew 26 feet 2 inches forward and 26 feet 2½ inches aft, and had 280 lbs. of steam in her boilers, her vacuum being 25·6 inches starboard and 25·5 inches port. The revolutions were 121·2 and 120·8 respectively, obtained by 31,203-I.H.P.—15,829 starboard and 15,374 port. The mean air pressure was ·35 inch, and the speed 23·23 knots, with a coal consumption of 1·94 lbs. per unit of power per hour. She finished the trial on her run up Channel and anchored at Spithead. The result of the full-speed trial was a little disappointing to the authorities, who had hoped for a somewhat higher speed. It is expected that some further alterations will be made in the screws of the "Drake," the next of the class to run her trials.

The new first-class battle-ship "Venerable" has returned to Chatham on the conclusion of her machinery trials, which were satisfactorily completed in the short period of eight days. This time would have been shortened had it not been for a slight mishap to the machinery just before the eight hours' full-power trial was to be started, which caused one day's delay. The vessel left Chatham on 20th May, and had a preliminary trial on the following day. On 22nd May she left the Nore for a 30 hours' coal-consumption trial at one-fifth power (3,000-I.H.P.). The draught of water was 26 feet 7 inches forward and 27 feet 1 inch aft. With a steam pressure in the boilers of 225 lbs. per square inch and the engines working at 65·3 revolutions starboard and 66·7 revolutions port, a speed of 11·45 knots was maintained. The vacuum in the condensers was 27·5 inches starboard and 27·1 inches port. The mean I.H.P. was 1,472 starboard and 1,610 port, giving a total of 3,082. The coal consumption was 2·01 lbs. per I.H.P. per hour. The second 30 hours' coal-consumption trial was at four-fifths power (11,500-I.H.P.), and this took place on 24th and 25th May. The draught of water was 26 feet 3 inches forward and 27 feet 1 inch aft. The steam pressure was 261 lbs. per square inch, and the revolutions 101·1 starboard and 102·5 port, while the vacuum in condensers was 27·7 starboard and 27·5 port. The speed by log was 16·8 knots. The starboard engine developed 5,590-I.H.P. and the port engine 5,774, a total of 11,364. The coal consumption was 1·95 lbs. per I.H.P. per hour. The eight hours' full-power trial took place on 28th May, and again excellent results were secured. The details were as follows:—Draught of water, forward 26 feet 4 inches, aft 27 feet 1 inch; speed of ship, 18·3 knots; steam pressure in boilers, 294 lbs. per square inch; air pressure in stokeholds, 0·1 inch; vacuum in condensers starboard 26·8 inches, port 27 inches; revolutions, starboard 111·1, port 112·4; mean I.H.P., starboard 7,600, port 7,745—total, 15,345. The coal consumption worked out at 2·145 lbs. per unit of power per hour.—*Times.*

Gun and Armour Plate Trials at Barrow.—A series of very interesting gun trials were carried out on the 9th and 23rd ult. at the Eskmeals range by Messrs. Vickers,

Sons & Maxim. Rear-Admiral W. H. May, the Controller of the Navy, was present on each occasion, while the First Sea Lord with Rear-Admiral W. H. Fawkes were also present on the second occasion. The firing was carried out under Admiralty conditions by 6-inch and 7·5-inch guns against 6-inch and 12-inch cemented (Krupp) steel armour plates, and the following tables, taken from *Engineering*, give the results :—

TABLE I.—*First, Second, and Third Rounds against* 11$\frac{3}{16}$*-inch Plate.*

Date : 9th May, 1902. Firing at Eskmeals range for trial of 7·5-inch and 6-inch Vickers armour-piercing projectiles fitted with Johnson cap against a 12-inch Vickers K.C. plate, No. 4,865. Ordnance No. : 1,037A, 6-inch B.L. Mark B. ; and No. 1,017A, 7·5-inch B.L., 50 calibres. Mountings : Naval pedestal.

Round.	Charge. Nature.	Charge. Weight.	Projectile and Fuze.	Velocity. Mean Muzzle.	Temperature of charge 80 deg. Fahr. Thermometer { Dry bulb 48 ,, / Wet ,, 47 ,, Barometer ... ... 30·25 in. S.V.	S.E.	Ramming.
		lb.		ft.-sec.	ft.-sec.	ft.-tons.	in.
1	R.R. 384, Nitro-cellulose	34	Vickers 6-in. A.P. shot, fitted with Johnson cap, 105 lb.	2856	2799	5705	41·65
2	Ditto	34	Vickers 6-in. A.P. shot, without cap, 100 lb.	2·80	2820	5513	41·55
3	Cordite $\frac{30}{30}$	43	Vickers 7·5-in. A.P. shell, fitted with Johnson cap, 205 lb.	2480	2444	8432	64·75

ROUND 1.—Completely perforated plate. Projectile was broken up. Penetration measured 18 in. to base of shot, after removing its fragments the penetration measured 2$\frac{3}{4}$ in. Extent of injury by scaling, 18·5 in. H. by 20·5 in. V. No cracks. Diameter of hole, 6 in. This shot struck exactly in front of a horizontal H girder, and bulged it back 1$\frac{1}{4}$ in., otherwise it would have gone completely through.

ROUND 2.—Projectile completely broken up. Penetration about 3$\frac{3}{4}$ in., but point of shot remained fused in plate. Extent of injury by scaling, 18$\frac{1}{2}$ in. H. by 19 in. V. No cracks. Diameter of portion of shot in hole = 8 in. There was no trace of bulge at back, or any displacement of backing.

ROUND 3.—Projectile broken up, but all the point portion, including 2 in. of core, remained in plate ; it was not, however, fused in as in Round 2, for a feeler could be inserted in many places round the periphery up to 7 in. from face of plate. Penetration to front end of core was 5 in. ; if, therefore, the point preserved its profile, the total penetration would be 9$\frac{1}{2}$ in. Base portion set up and part flowed in molten state into the front of core, moulding itself to its contour. Extent of injury, 23·5 in. H. by 21·5 in. V.

TABLE II.—*Fourth and Fifth Rounds against* 11$\frac{3}{16}$*-inch Plate.*

Date : 23rd May, 1902. Firing at Eskmeals range for trial of Vickers 6-inch armour-piercing shot fitted with Johnson cap, against a Vickers 12-inch K.C. plate, No. 4,865. Ordnance No. : 1,037A, 6-inch, Mark B. Mounting : Naval pedestal.

Round.	Charge. Nature.	Charge. Weight.	Projectile and Fuze.	Velocity. Mean Muzzle.	Temperature of charge 80 deg. Fahr. Thermometer { Dry bulb 55 ,, / Wet ,, 54 ,, Barometer ... ... 30·3 in. S.V.	S.E.	Ramming
		lb.		ft.-sec.	ft.-sec.	ft.-tons	in.
4	R.R. 384, Nitro-cellulose.	34	6-in. Vickers A.P. shot fitted with Johnson cap. Weight, 105·5 lb.	2841	2786	5676	41·75
5	Ditto	34	6-in. standard A.P. shot without cap. Weight, 100 lb.	2887	2827	5742	41·7

Three rounds had been previously fired at this plate on 9th May, 1902.

ROUND 4.—Shot completely perforated plate, but did not get through the wood backing or skin-plate. The shot remained in backing, the rear of base being 9-in. from surface of plate ; a feeler could be inserted along the outside of shot to a distance of 16-in. from surface of plate. The extent of injury by scaling was 20 in. H. by 22$\frac{1}{2}$ in. V.

ROUND 5.—Shot completely broken up. Penetration 3 in. Point of shot remained fused in plate. A large piece of shot rebounded and was found 20 ft. in front of plate.

TABLE III.—*Trials against the 6-inch Plate.*

Date: 23rd May, 1902. Firing at Eskmeals range for trial of Vickers 6-inch armour-piercing shot and 7·5-in. armour-piercing shell, both fitted with Johnson cap, against a Vickers K.C. plate, No. 4,126, 8 feet by 6 feet by 6 inches. Ordnance No.: 1,037A, 6-inch, Mark B, and No. 1,017A 7·5-inch, 50 calibres. Mounting Naval pedestal.

Round.	Charge. Nature.	Charge. Weight.	Projectile and Fuze.	Velocity. Mean Muzzle.	Temperature of charge 80 deg. Fahr. Thermometer { Dry bulb 55 ,, Wet ,, 54 ,, Barometer ... ... 30·3 in. S.V.	S.E.	Ramming
		lb.		ft.-sec.	ft.-sec.	ft.-sec.	in.
1	Cordite $\frac{20}{17}$, Lot 119	12·5	6-in. A.P. shot (Vickers), without cap. Weight 100 lb.	2034	1995	2766	41·25
2	Cordite $\frac{30}{30}$, Lot 117	35·312	7·5-in. A.P. shell, fitted with Johnson cap. Weight 205 lb.	2221	2186	6795	66·75
3	Cordite $\frac{20}{17}$, Lot 119	12·94	6-in. A.P. shot (Vickers), fitted with Johnson cap. Weight, 105 lb.	2007	1971	2829	41·31

ROUND 1.—Projectile broke up, point remaining fused in plate. Extent of injury by scaling, 24 in. H. by 22 in. V. There were no cracks. There were signs of a bulge at the back.

ROUND 2.—Complete perforation took place; no pieces of shell, except the base-plug, were found. The size of hole was 8·75 in. by 8·5 in. Extent of scaling, 14·5 in. H. by 14·5 in. V. The point of shell of this round, weighing 92 lb., was subsequently recovered, having penetrated 20 ft. into sand at rear of target.

ROUND 3.—Complete perforation took place. Projectile broke up, pieces being found in rear. Size of hole, about 6½ in. Extent of injury by scaling was 13 in. H. by 14 in. V.

A series of five aimed rounds was then fired from the 7·5-inch gun at a target 1,000 yards off. Starting with the gun loaded, the time to pressing trigger for fifth round was 31 seconds. All the rounds hit within a space about 6 feet H. by 5 feet V.—*Engineering.*

An interesting account of these trials was given in the *Times* of the 26th ult. from the pen of a special correspondent, a leading article based on his report appearing in the same issue of the paper. Special attention is called to the high velocities obtained at these trials from the propellent known as nitrocellulose, the introduction of a form of which into our Navy as a substitute for cordite has been strongly advocated by Messrs. Vickers, backed up by a section of the Press, notably the *Globe*. In this connection the *Times* correspondent in his letter commits himself to the statement that nitrocellulose has been adopted by the War Office for the new coast-defence guns, and the *Times* in its leading article practically implies that the Admiralty ought to follow suit. It does not appear, however, that there is any foundation for the statement that nitrocellulose in any shape or form has been adopted by the War Office. Experiments with a nitrocellulose have been carried out for some time past, and the climatic tests, among others, to which it has been subjected, are not yet complete, but we believe it will be found that the results of the trials, anyway up to the present, are not sufficiently promising to justify its introduction into the Service as the propellent of the future, as its keeping properties have not been at all satisfactorily proved, and pressures are found to be very uncertain and with a tendency to abnormal ones. On the other hand, it is now an open secret that, as the result of a series of exhaustive experiments by the Explosives Committee, a body of whose work but little is heard or known, a modified form of cordite is being introduced, which, it is believed, will not be inferior to

the Rottweil nitrocellulose as a propellent, and that by its means the muzzle velocity of the new Mark VII. 6-inch guns, which are mounted in our battle-ships of the "Implacable" class, will be increased to 2,800 foot-seconds, practically equal to the velocity which is claimed for the new French 6·4-inch gun; while its erosive action on the guns, as compared with the present cordite, will be much diminished.

With regard to the Johnson cap, of which so much is now being heard, we do not think we are wrong in stating that its value under certain conditions is fully recognised by our naval authorities, and progressive trials have been carried out with it during the last two or three years; the proper construction of the caps is a matter of great nicety, but when made they are easily fitted, and most exhaustive trials at varying velocities are therefore quite necessary before committing ourselves to any one special maker.

The *Times* correspondent in his article speaks of a number of French battle-ships which have been built and are being built to carry the new 6·4-inch guns in their secondary batteries. As a matter of fact, there are only two French battle-ships at present in commission which carry the new gun, viz., the new first-class battle-ship "Iéna," which carries eight of them, and the "Amiral-Duperré," an older ship, which has lately received five; the new first-class battle-ship "Suffren," now approaching completion, is to carry ten; while the new ships of the "Patrie" class are to carry as many as eighteen.

FRANCE.—The following are the principal promotions and appointments which have been made: Vice-Admirals—A. A. Gervais to be Commander-in-Chief of the Manœuvre Fleet (1902); De la Bonninnière de Beaumont to be Commander-in-Chief of the Squadron of the Mediterranean and Levant; C. F. E. de Courthille to be Commander-in-Chief of the Atlantic Fleet; C. P. Touchard to be Maritime Prefect at Cherbourg; C. L. T. Courrejolles to be Maritime Prefect at Brest. Rear-Admirals—C. P. Touchard and L. A. Caillard to be Vice-Admirals; P. A. Servan, P. F. Gourdon, and J. T. Péphau to command of divisions in the Atlantic Fleet. Capitaines de Vaisseau—M. De Fauque de Jonquières, P. L. Germinet, and H. E. H. Boué de Lapeyrère to be Rear-Admirals; O. A. E. Le Clerc to "Marceau"; C. P. M. Poidlouë to "Magellan" and the Naval School at Bordeaux; E. A. Pailhès to "Charles-Martel"; E. A. Voiellaud to "Iéna"; E. J. P. Perrin to "Carnot." Capitaines de Frégate—A. M. Poidlouë and P. Adigard to Capitaines de Vaisseau; R. C. E. Maudet to "Troude"; P. M. A. Coustolle to "Bugeaud"; V. B. Sénès to "Pascal"; F. C. Lahalle to "La Hire."—*Journal Officiel de la République Française.*

Vice-Admiral Gervais has again been appointed to the command of the fleet which will be assembled for the annual manœuvres this year; this will probably be the last occasion on which this distinguished officer will hoist his flag, as he reaches the age limit this winter, when in the ordinary course he will be retired. No details as to the forthcoming manœuvres have yet been published, but it is believed that they will again be held in the Mediterranean between the coast of Spain and Algeria; the Squadron of the North proceeding during the latter part of June to take part in them. The new organisation of the Atlantic Fleet is to take effect from 28th June, on which date Vice-Admiral de Courthille will assume the formal command, which entails not only that of the Squadron of the North, but also of the Atlantic, Newfoundland, and Icelandic Divisions. In some quarters it is believed that the work entailed by the new organ-

isation on the Commander-in-Chief will prove too much for one man ; but experience alone will show whether this view is right.

The Presidential Cruise to the Baltic.—The first-class armoured cruiser "Montcalm," flying the flag of Vice-Admiral Roustan, and having the President of the Republic on board, arrived at Dunkirk at 10 a.m. on Tuesday, 27th ult. from Cronstadt and Copenhagen, accompanied by the first-class cruiser "Guichen" and the destroyers "Cassini," "Yatagan," and "Fauconneau," which had formed the Presidential escort to Russia. After the President had disembarked, the "Montcalm" and "Guichen," with the three destroyers, proceeded to Brest, where they arrived on the morning of the 30th ult. ; Vice-Admiral Roustan struck his flag on board the "Montcalm" the next morning, and resumed his duties as Maritime Prefect of the port, in which, however, he is to be relieved by Vice-Admiral de Courrejolles, when he will proceed to Toulon to assume the duties of Maritime Prefect of that port. The Admiral has expressed himself as much pleased with the performances of the "Montcalm" during the recent cruise to the Baltic ; the ship's engines are supposed to develop at full speed 19,600-I.H.P., giving a speed of 21 knots, her normal I.H.P. being 10,000, which ought to give a speed of 17 knots ; during the cruise the ship maintained without difficulty a speed of 18 knots for sixty-two hours, and of 19 knots, occasionally increased for short intervals to 20, for thirty hours ; this speed was maintained by the division without any apparent difficulty. The engines and the Normand-Sigaudy water-tube boilers both worked well, the necessary pressure being easily maintained and without trouble to the stokers, while a careful overhaul since her return to Brest has revealed no defects. The cabins erected for the President and his suite are now being dismantled, and the ship prepared for her visit to England, where she is to represent the French Navy at the Coronation festivities, flying the flag of Rear-Admiral Richard, who has only lately struck his flag from command of the Atlantic Division.

The Cruise of the "Gaulois."—We mentioned last month that the first-class battle-ship "Gaulois," attached to the Active Mediterranean Squadron, left Toulon on the 5th ult. for the United States. She carried General de Brugère, Vice-Admiral Fournier, and the members of the mission charged to represent France at the inauguration of a statue to General the Count de Rochambeau, who commanded the division of 5,000 French troops, sent by King Louis XVI. to the assistance of the revolted Colonists in North America, the recognition of whose independence by the French Government in 1777 brought about war with England in the following year. Rochambeau arrived at Newport 13th July, 1779, and from that time on took a leading part in the operations which resulted in the surrender of Lord Cornwallis and his army at Yorktown on the 19th October, 1781.

The "Gaulois," it may be mentioned, is a ship of 11,275 tons displacement, 385 feet 6 inches long, with a beam of 63 feet 6 inches, and a draught or 27 feet 6 inches, and her passage across the Atlantic is described in the French newspapers as excellent, and silences, in their opinion, the views of those who thought battle-ships would be confined to a short distance from their bases in war. The average speed of the 18-knot "Gaulois" was between 10 and 14 knots per hour. She has three propellers, Belleville boilers, and engines of 14,500-H.P.

It may be interesting to recall that the "Renown," of 12,350 tons, two propellers, 380 feet long, 72 feet beam, 26¾ feet draught, and 12,000-H.P., crossed the Atlantic from Bermuda to Plymouth three years ago at an average of about 15 knots per hour. The "Renown" was completed in 1896, the year in which the "Gaulois" was launched and the cost of the former vessel was considerably less than that of the latter.

Cruise of the Northern Squadron.—The Northern Squadron, consisting of the battle-ships "Formidable" and "Courbet," and the coast-defence battle-ships "Amiral-Tréhouart," "Bouvines," "Valmy," and "Jemmapes," and the cruisers "Bruix" and "Dupuy de Lôme," and the destroyer "Durandal" arrived at Cherbourg on 16th May to coal. The armoured cruiser "Bruix," flying the flag of Rear-Admiral Gourdon, commanding the Light Division of the Northern Squadron, with the second-class cruiser 'D'Assas," and the third-class cruiser "Surcouf," left Brest on the 17th ult. for Martinique, conveying provisions and stores, etc., for the sufferers from the late eruption, and the battle-ships proceeded to Dunkirk to await the return of the President from Russia on 26th May.

The two Ministers MM. Waldeck-Rousseau and de Lanessan arrived at Cherbourg from Brest on 16th May in the "Formidable," flag-ship, after 24 hours at sea, which had been utilised by the Northern Squadron in carrying out target practice and other evolutions. The following account of this short cruise is taken from *Le Temps*:—

"The fleet, under the command of Vice-Admiral de Courthille, left Brest on Thursday morning, 15th May, at 8.30 o'clock, in line ahead formation, the "Formidable" leading, followed by the "Courbet," "Amiral-Tréhouart," and "Dupuy de Lôme," and the Second Division, under Rear-Admiral Péphau, consisting of the "Bouvines" (flag), "Valmy," and "Jemmapes," the destroyer "Durandal" acting as scout for the fleet.

At 9 a.m. the Goulet of Brest was cleared by the south pass, and when outside the squadron shaped a course to the southward; Admiral de Courthille seemed to take a pride in taking his ships through the most difficult navigation, making the long line wind in and out between the high rocks of the Toulinguet Channel, which overhung his battle-ships as they glided between them. From Toulinguet the squadron steered for Raz de Sein, a part of the coast generally avoided by navigators, and then rounding the Chaussée altered course to the northward, leaving Armen L'Ho on the starboard hand, and later in the day, after target practice was completed, the squadron entered the dangerous Fromveur Channel between the Islands of Ushant and Molène where the terrible disaster happened to the "Drummond Castle."

The difficult navigation ended with the Fromveur Channel, the difficulties being increased in this case by the want of homogeneity in the ships at present composing the Northern Squadron. When all the vessels of a fleet have the same turning powers following the leader becomes an easy matter; but in the present case, though the coast-defence battle-ships like the "Amiral-Tréhouart" can turn in their own length, the "Dupuy de Lôme," on the contrary, has a very large turning circle. Though, however, attended with some risks, these exercises are of the greatest use, as they form the best school of navigation for both officers and men. The coast-defence battle-ships "Bouvines," "Tréhouart," etc., were constructed with a view to navigation in narrow waters, and were in their proper sphere. They are a type of vessel that has its faults, their low freeboard causing the fore and after ends to be constantly covered with the waves, but since they have been fitted with bilge-keels their stability is remarkable; they still pitch a little, but do not roll at all, and have such a steady platform that the shooting from their guns is most accurate. It has been suggested that the Northern Squadron should be composed of one regular battle-ship to act as flag-ship, the remainder of the vessels being coast-defence battle-ships of the "Bouvines" and "Henri IV." type, which latter is now undergoing her trials; the squadron would gain much in homogeneity if thus constituted.

After leaving Armen L'Ho, as before stated, the squadron proceeded in search of the target, which was the old wooden despatch-vessel "Surcouf," a ship about 161 feet long, 26 feet beam, and with a freeboard about 12 feet above the water, which was found drifting in the Iroise, the tug "Infatigable," which had towed it there, had cast it off when the squadron was sighted. Target practice did not commence at once, the range being not clear of fishing-boats, but about 3 p.m. the "Formidable" opened fire with her light guns and got the distance, and three minutes later all the ships opened fire with both light and heavy guns. It was a most imposing sight; under the shock of the shells the old ship pitched and rolled and appeared to dance on the waves which, torn by the bursting projectiles, covered her with spouts of water. Almost the first shot took away the flag; the superstructure was soon pierced so as to show daylight, and the vessel soon appeared to be sinking bodily on an even keel; first the hull, then the superstructure, and finally the mast disappeared, and fifteen minutes after fire had been opened the "Surcouf" had gone to the bottom.

The following table shows the result of the practice:—

Ships.	Number of Rounds.		Distance Yards.
	Fired.	Estimated Hits.	
Formidable...	74	12	4,200 to 2,400
Courbet	57	3	do.
Amiral-Tréhouart	63	9	do.
Bouvines	48	5	4,300 to 3,200
Valmy	18	2	do.
Jemmapes	15	5	4,300 to 3,800
Dupuy de Lôme	65	5	4,300
	340	41	

The percentage of hits is 12 per cent., which is satisfactory, when it is remembered that the percentage at the battle of Santiago was 2½ per cent., and that the target was of much smaller dimensions than the Spanish cruisers at which the Americans were firing. It must be stated also that the weather was not very clear, it had rained in the morning, and at 11 o'clock it was so thick that it was feared that the firing would have to be given up; it commenced to clear about 12.30, but the horizon remained very misty.

The destination of the squadron had been St. Malo, and it was to have been attacked off Morlaix by the torpedo-boats of the *Mobile-Défense*, but the sea became so rough in the evening that it was decided to proceed straight to Cherbourg, and the "Dupuy de Lôme" was sent on ahead to warn the torpedo-boats of the change and order them to return. The squadron arrived at Cherbourg on the 16th, and the Ministers disembarked and proceeded immediately by train to Paris.

Submarines.—The Minister of Marine has ordered the commencement of 13 new submergible vessels, 8 to be built at Toulon and 5 at Cherbourg. The objection to the submergible type of submarine has hitherto been the length of time necessary to effect submergence; the "Narval" class took half an hour to perform the operation; in the "Sirène" class the time was reduced to a little over 10 minutes; but the new class now to be built will be capable of submerging in 5 minutes. This is a most satisfactory improvement, when it is remembered that the submergible type is designed to act

also on the surface, and that the motive power has to be completely changed from steam to electricity before making a descent.

A new periscope with telescopic joints for use with submarine-vessels, the invention of an ensign de vaisseau, is under trial. The telescopic joints admit of the height of vision being raised or lowered as desired.

During the night attacks and exercise which took place off Hyères on 30th April, the submarine "Gustave Zédé," which came out from Toulon to endeavour to torpedo the "Jauréguiberry," ran ashore near Porquerolles; her position was critical, but with the assistance of the tug "Hercules" she was refloated, she lost a torpedo and some portion of her under-water fittings, but was not seriously damaged.

A new pattern pendulum for registering the rolling of a ship at sea, the invention of an Italian naval officer, is being experimented with in the French Navy.—*Le Yacht* and *Le Temps*.

RUSSIA.—*The Naval Estimates for 1902.*—The Estimates for 1902 amount to 98,318,984 roubles (£15,731,447 14s.), showing an increase of 4,721,318 roubles (£755,410 18s.) over the previous year. The principal items are as follows:—

	1902.			1901.	
	Roubles.	£	s.	£	s.
Central Administration and Port Services	2,402,674 =	(384,427	17)	376,180	10
Naval School Establishments	1,128,638	(180,582	2)	181,242	15
Naval Construction and Guns	36,903,856	(5,904,617	0)	5,610,515	13
Cost of Ships in Commission...	20,485,003	(3,277,600	10)	3,260,608	10
Hydrographic Service and Lighthouses ...	1,215,809	(194,929	9)	209,945	3
Maintenance of Land Establishments, Buildings, etc.	5,359,994	(857,599	1)	904,694	12
Workshops and Building Establishments	5,740,523	(918,483	15)	931,627	1
Pay and Subsistence Money	10,891,845	(1,742,695	4)	1,663,390	8
Other Allowances	1,406,478	(225,036	10)	221,644	10
Medical and Hospital Service	1,215,063	(194,410	2)	192,604	6
Miscellaneous Expenses	1,787,668	(286,026	18)	262,021	9
Survey of mouths of the Obi and Yenisei	54,700	(8,752	0)	8,640	0
Improvement of the Port of Vladivostok	2,000,000	(320,000	0)		
Improvement of Port Arthur	3,200,000	(512,000	0)	24,000	0
Construction of Port Alexander III., Libau	4,026,733	(644,277	6)	512,000	0
Repairs to damage caused by the fire at Gallieny Island	500,000	(80,000	0)		
Total	98,318,984	(15,731,447	14)	14,359,114	17

The increase in Vote 1 of 46,384 roubles (£7,421 : 9s.) is due to the re-organisation, starting from 1st May, 1902, of the administration of Port Arthur, which will be continued yearly for the present. In Vote 2 there is a decrease of 23,229 roubles (£3,716 : 13s.), the pay of the officers of the newly-created Artillery and Torpedo Division of the Baltic having been transferred to Vote 4; on the other hand, Vote 2 has been increased by 24,729 roubles (£3,956 : 13s.) in consequence of the enlargement of the Naval Engineers' School attached to the Black Sea Training Division, the net result being a decrease of 4,129 roubles (£660 : 13s.). The vote for new constructions shows a decrease of 1,146,680 roubles (£183,468 : 14s), although there is an actual increase for

shipbuilding of 865,000 roubles (£138,400), and 7,800 roubles (£1,248) for machinery; but against this is a decrease of 250,000 roubles (£40,000) for armour, 667,000 roubles (£106,720) for armaments, and of 1,102,680 roubles (£176,428 : 16s.) for the Reserve Funds; there is also a decrease of 193,404 roubles (£31,024 : 13s.) in the amount required for guns and mountings. Under this Vote are also included the following sums:—50,000 roubles (£8,000) for the purchase of 15 Maxim guns for use in military tops; 153,180 roubles (£24,508 : 16s.) for the second year running for the purchase of nine thousand 7-millimetre guns; and 281,224 roubles (£44,995 : 17s.) for the purchase of copper cartridge cases for smokeless powder for the 15- and 30·5-centimetre guns.

For the torpedo equipment of the first-class battle-ship "Kniaz Souvarov," the second-class cruisers "Kagoul" and "Otchakov," and the four new 350-ton destroyers, as well as the purchase of the Geissler apparatus for the tube-discharges, a sum of 439,076 roubles (£70,252 : 3s.) is provided, which is less by 117,477 roubles (£18,796 : 6s.) than last year. There is an addition of 160,000 roubles (£25,600) as a first vote for 80 torpedoes of the new 15-foot long model, which will be made at the Oboukhov Works and provided with the Obri apparatus; 300,000 roubles (£48,000) as a first vote for 150 similar torpedoes to be provided by Lessner, and 22,558 roubles (£3,609 : 6s.) for 10 of the same torpedoes, which will be made at the Nicolaieff Yard.

According to the arrangements for ships in commission for this year, the second-class battle-ships "Sissoi Velikie" and "Navarin"; the belted cruisers "Dimitri Donskoi" and "Vladimir Monomakh," and the second-class cruiser "Admiral Korniloff," which belong to the Baltic Squadron but have been temporarily attached to the Pacific Squadron as a reinforcement, are returning home, their places being taken by the new first-class battle-ships "Peresviet" and "Oslablia." They will go to Libau, which is supposed to be used only for the training-ships, as at present they cannot be received at Kronstadt, which in normal circumstances is the port for the fighting-ships of the fleet.

The strength of the *personnel* from 1899 to 1902 has been increased each year on an average by 5,000 men; the numbers were 41,156 men at the end of 1898 and 57,260 men at the end of 1901. Last year there was an increase only of about 3,000 men. The number of men embarked on ships in commission during the current year is 43,122.

The credit assigned for the completion of the Port at Libau amounting to 4,026,733 roubles (£644,277 : 6s.) (800,000 roubles (£128,000) more than last year) is conditional, and the money may possibly not be used. Out of the total increase in the Estimates for 1902, 4,200,000 roubles (£672,000) are devoted to the improvement of Vladivostok and Port Arthur, and to making good the damage caused by the late fire at the Gallieny Yard, so that excluding this sum there is only an increase over the normal Budget of 500,000 roubles (£80,000).—*Mittheilungen aus dem Gebiete des Seewesens.*

UNITED STATES.—*Appeal of Admiral Schley.—Memorandum by the President.*—White House, 18th February, 1902.—I have received the appeal of Admiral Schley and the answer thereto from the Navy Department. I have examined both with the utmost care, as well as the preceding appeal to the Secretary of the Navy. I have read through all the testimony taken before the Court and the statements of the counsel for Admirals Sampson and Schley; have examined all the official reports of every kind in reference to the Santiago naval campaign, copies of the logbooks, and signal books, and the testimony before the Court of Claims, and have also personally had before me the four surviving captains of the five ships, aside from those of the two admirals, which were actively engaged at Santiago.

It appears that the Court of Inquiry was unanimous in its findings of fact and unanimous in its expressions of opinion on most of its findings of fact. No appeal is made to me from the verdict of the Court on these points where it was unanimous. I have, however, gone carefully over the evidence on these points also. I am satisfied that on the whole the Court did substantial justice. It should have specifically condemned the failure to enforce an efficient night blockade at Santiago while Admiral Schley was in command. On the other hand, I feel that there is a reasonable doubt whether he did not move his squadron with sufficient expedition from port to port. The Court is a unit in condemning Admiral Schley's action on the point where it seems to me he most gravely erred; his "retrograde movement" when he abandoned the blockade, and his disobedience of orders and misstatement of facts in relation thereto. It should be remembered, however, that the majority of these actions which the Court censures occurred five weeks or more before the fight itself; and it certainly seems that if Admiral Schley's actions were censurable he should not have been left as second in command under Admiral Sampson. His offences were in effect condoned when he was not called to account for them. Admiral Sampson, after the fight, in an official letter to the Department alluded for the first time to Admiral Schley's "reprehensible conduct" six weeks previously. If Admiral Schley was guilty of reprehensible conduct of a kind which called for such notice from Admiral Sampson, then Admiral Sampson ought not to have left him as senior officer of the blockading squadron on the 3rd of July, when he (Sampson) steamed away on his proper errand of communication with General Shafter.

We can therefore for our present purposes dismiss consideration of so much of the appeal as relates to anything except the battle. As regards this, the point raised in the appeal is between Admiral Sampson and Admiral Schley, as to which was in command, and as to which was entitled to the credit, if either of them was really entitled to any unusual and pre-eminent credit by any special exhibition of genius, skill, and courage. The Court could have considered both of these questions, but as a matter of fact it unanimously excluded evidence offered upon them, and through its President announced its refusal to hear Admiral Sampson's side at all; and in view of such exclusion the majority of the Court acted with entire propriety in not expressing any opinion on these points. The matter has, however, been raised by the President of the Court. Moreover, it is the point upon which Admiral Schley in his appeal lays most stress, and which he especially asks me to consider. I have therefore carefully investigated this matter also, and have informed myself upon it from the best sources of information at my command.

The appeal of Admiral Schley to me is not, as to this, the chief point he raises, really an appeal from the decision of the Court of Inquiry. Five-sixths of the appeal is devoted to this question of command and credit; that is, to matter which the Court of Inquiry did not consider. It is in effect an appeal from the action of President McKinley three years ago when he sent in the recommendations for promotion for the various officers connected with the Santiago squadron, basing these recommendations upon his estimate of the credit to which the officers were respectively entitled. What I have to decide, therefore, is whether or not President McKinley did injustice in the matter. This necessarily involves a comparison of the actions of the different commanders engaged. The exhaustive official reports of the action leave little to be brought out anew, but as the question of Admiral Sampson's right to be considered in chief command, which was determined in his favour by President McKinley, and later by the Court of Claims, has never hitherto been officially raised, I deemed it best to secure statements of the commanders of the five ships (other than the "Brooklyn" and

"New York," the flag-ships of the two admirals) which were actively engaged in the fight. Admiral Philip is dead. I quote extracts from his magazine article on the fight, written immediately after it occurred; closing with an extract from his letter to the Secretary of the Navy of 27th February, 1899 :—

"It was the blockade that made the battle possible. The battle was a direct consequence of the blockade, and upon the method and effectiveness of the blockade was very largely dependent the issue of the battle. . . . Under the orders of Admiral Sampson the blockade was conducted with a success exemplified by the result. . . . When the Spanish admiral at last made his dash to escape, we were ready—ready with our men, with our guns, and with our engines. . . . It was only a few minutes after we had seen the leader of the advancing squadron that it became apparent that Cervera's plan was to run his ships in column westward in an effort to escape . . . Before he had fairly found himself outside the Morro, the entire blockading squadron—'Indiana,' 'Oregon,' 'Iowa,' 'Brooklyn,' and 'Texas'—was pumping shell into him at such a rate as virtually to decide the issue of the battle in the first few moments. All our ships had closed in simultaneously. . . . Then occurred the incident which caused me for a moment more alarm than anything Cevera did that day. . . . Suddenly a whiff of breeze and a lull in the firing lifted the pall, and there bearing toward us and across our bows, turning on her port helm with big waves curling over her bows and great clouds of black smoke pouring from her funnels, was the 'Brooklyn.' She looked as big as half a dozen 'Great Easterns,' and seemed so near that it took our breath away. 'Back both engines hard!' went down the tube to the astonished engineers, and in a twinkling the old ship was racing against herself. The collision which seemed imminent, even if it was not, was averted, and as the big cruiser glided past, all of us on the bridge gave a sigh of relief. Had the 'Brooklyn' struck us then it would probably have been the end of the 'Texas' and her half thousand men. . . . At ten minutes to 10 (the Spanish ships had appeared at about 9.30) . . . the 'Iowa,' 'Oregon,' and 'Texas' were pretty well bunched, holding a parallel course westward with the Spaniards. The 'Indiana' was also coming up, well inside of all the others of our squadron, but a little in the rear, owing to her far eastward position at starting. . . . About a quarter past 10 the 'Teresa,' which had been in difficulties from the moment she left the shelter of the Morro, turned to seek a beaching place. She was on fire, and we knew that she was no longer a quantity to be reckoned with. Five minutes later our special enemy, the 'Oquendo,' also turned in shore. . . . The 'Viscaya,' kept blazing away viciously, but the pounding she got from our four ships, more particularly the 'Oregon,' was too much for her, and in half an hour she too headed for the beach. . . . I determined to push on with the 'Texas.' . . . It gives me pleasure to be able to write that, old ship as she is and not built for speed, the 'Texas' held her own and even gained on the 'Colon' in that chase. . . . Admiral Sampson was Commander-in-Chief before, during, and after the action."

Captain Clark's statement is as follows :—

"The credit for the blockade which led up to the fight is of course Admiral Sampson's. The position of the ships on the morning of the fight in a semi-circle head-on to the harbour, in consequence of which we were able to close in at once, was his. In closing in, that is, in making the first movements, we were obeying his instructions; though, as a matter of fact, we would all have closed in any way, instructions or no instructions. When the Spanish ships came out of the harbour the navigator of my ship saw the 'New York' to the eastward, but I received no signal of any kind from

the 'New York' during the action, nor was she near enough to signal directly to me until after the 'Colon' surrendered.

"The engagement may be said to have been divided into three parts: First, the fight proper, while the Spanish squadron was coming out of the harbour and until it was clear of the Diamond Shoals and definitely headed westward; second, the running fight with the already damaged vessels as they fled westward, until the 'Teresa,' 'Oquendo,' and 'Viscaya' ran ashore; and third, the chase of the 'Colon,' during which there was practically no fighting. During the first stage I did not see the 'Brooklyn' or receive any signals from her. At the close of this stage the 'Oregon' had passed the 'Iowa' and 'Texas,' and when we burst out of the smoke I saw the four Spanish ships going west apparently uninjured, and followed hard after, at the same time observing the 'Brooklyn' a little ahead and offshore. She was broadside to the Spanish vessels and was receiving the weight of their fire, and was returning it. The 'Brooklyn' and the 'Oregon' thereafter occupied substantially these positions as regards each other, being about equidistant from the Spanish ships as we successively overtook them, except when the 'Oregon' attempted to close with the 'Oquendo.' The heaviest fighting was at the harbour mouth and while the enemy was breaking through or passing our line. Not long after the running fight began the 'Teresa' and then the 'Oquendo' turned and went ashore, the 'Viscaya' continuing for some distance farther before she was beached. Throughout this running fight the 'Brooklyn' and 'Oregon' were both hotly engaged, being ahead of any of our other ships; and we then constituted the western and what I regard as the then fighting division of our fleet. I considered Commodore Schley in responsible command during this running fight and chase so far as I was concerned, and acknowledged and repeated a signal he had flying, for close action or something of the kind. As, however, the problem was perfectly simple, namely, to pursue the Spanish ships as I had been doing before I saw the 'Brooklyn,' he did not, as a matter of fact, exercise any control over any movement or action of the 'Oregon,' nor did I perform any action of any kind whatever in obedience to any order from the 'Brooklyn' neither as to my course nor as to my speed, nor as to my gun fire during the fight or chase.

"The 'Oregon' always had fires under all boilers. In spite of the speed shown by the 'Oregon' in this fight, she had not been and is not classed as the fastest ship, but during all her service, in order that no scale should form in them, not one of our boilers was used for condensing, though the resulting discomfort for all hands was an additional hardship for her commanding officer."

The following is Admiral Evans's statement:—

"The credit for the blockade, for the arrangement of the ships at the opening of the fight, and for the first movements forward into the fight, must of course, belong to Admiral Sampson, whose orders we were putting into effect. When the fight began Admiral Sampson's ship, the 'New York,' was in plain sight, I saw her turning to overtake us. Throughout the fight I considered myself as under his command, but I received no orders from him until the 'Viscaya' was aground. Nor did I receive any orders whatever from the 'Brooklyn,' nor should I have heeded them if I had received them, inasmuch as I considered Admiral Sampson to be present and in command.

"The heavy fighting was during the time when the Spanish vessels were coming out of the harbour and before they had stretched fairly to the westward. When they thus stretched to the westward we all went after them without orders—of course we could do nothing else. Until the 'Teresa' and 'Oquendo' ran ashore the 'Iowa' was close behind the 'Oregon' and ahead of the 'Texas,' and all of us were firing

steadily at the Spanish ships. The 'Texas' then recovered her speed—for she was dead in the water after having backed to avoid the 'Brooklyn,' when the 'Brooklyn' turned—and she went ahead of the 'Iowa.' Both of us continued to fire at the 'Viscaya' until she went ashore. Then I stopped but the 'Texas' followed the 'Brooklyn' and the 'Oregon' after the 'Colon.'

"When the battle began the 'New York' was not much farther to the eastward of me than the 'Brooklyn' was to the westward. After the 'Viscaya' had grounded the 'New York' overtook me and signalled me to return to the mouth of the harbour to prevent any other Spanish ship from coming out and attacking the transports. I received no signals of any kind from the 'Brooklyn.' All we had to do was to close in on the Spanish squadron as it came out of the harbour, in obedience to the orders of Admiral Sampson, and then, when the heaviest fighting was over the Spanish ships were trying to escape to the west, to follow them—and of course there was no signal necessary to tell us to follow a fleeing enemy.

"The machinery of the 'Iowa' was not in condition to get the best speed, though every effort had been made to make it so. Her cylinder heads had not been off for more than six months, owing to the service she was performing. Her bottom was very foul, as she had not been docked for a period of seventeen months. The 'Indiana' was unavoidably in even worse shape.

"The 'New York' had left the blockading line flying the signal 'Disregard the movements of the Commander-in-Chief,' a signal frequently made and well understood by the entire fleet. It did not transfer the command. No signal was made for the second-in-command to assume command of the fleet, which was usually done by the Commander-in-Chief before reaching the limit of signal distance when he proposed for any reason temporarily to relinquish his command to the next ranking officer."

The following is Admiral Taylor's statement :—

"At the beginning of the fight the 'New York' was about as far to the eastward of me as the 'Brooklyn' was to the westward. The only signal I received from the 'New York' was at the very close of the fight, when she signalled me to return and guard the mouth of the harbour so that nothing should come out and attack our transports. I received no signal whatever from the 'Brooklyn,' and should not have heeded any if one had been made, as I considered Admiral Sampson present and in command. From her position the 'Indiana' took full part in the actual fight as the Spanish ships came out of the harbour. When they ran to the westward the 'Indiana' fell behind, but continued firing at them and at the torpedo-boats until all but the 'Colon' were sunk or beached. I saw the 'Brooklyn' turn and run out seaward, seemingly over a mile, about the time the rear one of the Spanish ships turned to the west ; if instead of making this loop the 'Brooklyn' had stood straight in towards the Spaniards, as the other American ships did, it seemed to me that the fight would have been settled then, without need of the long chase."

The following is Commander Wainwright's statement :—

"At the outset of the fight the 'New York' was not much farther away from me in one direction than the 'Brooklyn' was in the other and was in plain sight. A signal from Admiral Taylor in connection with my moving forward to attach the torpedo-boats was the only signal I received. I made one to the 'New York' just before the last torpedo-boat sank. The 'New York' at that time was coming up under the fire of the batteries, and herself fired a couple of shots at the torpedo-boat. Of course Admiral Sampson was present and in command. I received no signals from the 'Brooklyn,' and would not have noticed her at all had it not been for the fact that when the other vessels closed in she made what has been since called 'the loop,' so

that my attention was attracted by not seeing the 'Texas,' because she stopped, and by not seeing the 'Brooklyn,' because she went to seaward, away from the Spanish vessels. In other words, the left or westward part of our line was refused, and this attracted my attention, because it seemed to me from where I was that this permitted the Spanish vessels to try to escape to westward."

The survey of the damages of the four Spanish war-vessels shows that in addition to several score hits by the 6-pounder and 1-pounder guns of the American fleet, they were struck forty-three times by the larger guns of 4 inches calibre and over. The "Colon," which came out inside the others and did comparatively little fighting, received but three of these hits. The other three ships, which bore the brunt of the action, received forty among them. Of these forty, eleven, according to the report of the Board which examined into them, were by 4-inch guns, ten by 5-inch guns, four by either 4 or 5 inch (the Board could not determine which), while one was by either a 5 or 6 inch, twelve were by 8-inch, and two by 12-inch guns. All of our big ships except the "Texas" had 8-inch guns. Only the "Texas" and "Iowa" had 12-inch guns. The "Oregon" and "Indiana" had 13-inch guns; and they and the "Texas" had 6-inch guns. The only 4-inch guns were on the "Iowa"; the only 5-inch guns on the "Brooklyn." Therefore on the three Spanish ships which did the bulk of the fighting, out of the forty large calibre shots that struck them eleven certainly came from the "Iowa," ten certainly from the "Brooklyn," four from either the "Iowa" or the "Brooklyn," and two from either the "Iowa" or the "Texas." Of the three which struck the "Colon" two were 5-inch and must have come from the "Brooklyn"; one was either a 5-inch or a 6-inch. It must be remembered that the 4 and 5-inch guns were the only quick-firers above 6-pounders in our fleet, and that they were not only much more rapidly but much more surely handled than were the larger and slower-firing guns. The damage and loss of the American vessels were trivial. The only loss suffered was aboard the "Brooklyn," where one man was killed and one wounded. In damage, the cost of the repairs shows that the "Iowa" suffered most and the "Oregon" least. The American ships engaged possessed a more than twofold material superiority over the Spanish ships, and the difference in the handling of their guns and their engines was even greater. We have just cause to be proud of the vigilance and instant readiness our ships displayed, and the workmanlike efficiency with which they were handled. The most striking act was that of the "Gloucester," a converted yacht, which her commander, Wainwright, pushed into the fight through a hail of projectiles, any one of which would have sunk her, in order that he might do his part in destroying the two torpedo-boats, each possessing far more than his own offensive power.

From the statements of the captains above, from the official reports, and from the testimony before the Court of Inquiry, the fight can be plotted with absolute certainty in its important outlines, though there is conflict as to minor points. When the four Spanish cruisers came out of the harbour the "New York" had left her position in the blockading line forty or forty-five minutes before. She had hoisted the signal "Disregard the movements of the Commander-in-Chief," but had not hoisted the signal to the second-in-command to take charge, which, as appears by the signal book, was sometimes, but not always used when the command was transferred. As soon as the engagement began the "New York" turned and steamed back, hoisting a signal to close in, which, however, none of the squadron saw. She was in plain sight, and not very much farther from the easternmost blockading ships than the latter were from the "Brooklyn" which was the westernmost of the line. As soon as the Spanish ships appeared the five big American blockaders started towards them in accordance with the standing orders of Admiral Sampson. After this first move each acted purely on his

own initiative. For some minutes the Spanish and American vessels steadily approached one another and the fighting was at its hottest. Then the already damaged Spanish ships turned to the westward, while at the same time the westernmost American vessel, the "Brooklyn," which was nearest the Spanish line, turned to the eastward, making a loop or three-quarter circle, at the end of which she again headed westward, farther off from and farther behind the Spanish vessels than before the loop had begun, but still ahead of any of the American vessels, although farther outside. The "Texas," the next ship to the "Brooklyn," either was or conceived herself to be put in such jeopardy by the "Brooklyn's" turn toward her that she backed her engines, coming almost or quite to a standstill; so that both the "Oregon" and the "Iowa," which were originally to the eastward of her, passed her, and it was some time after she again started before she regained her former position relatively to the Spanish vessels. The Spanish vessels had straightened out in column for the west, the "Colon" going inside of the others and gradually forging ahead of them, without suffering much damage. The two torpedo-boats, which had followed them out of the harbour, were now destroyed by the fire of the rearmost of the American big vessels and of the "Gloucester," which headed straight in for them, paying no more heed to their quick-fire guns than to the heavy artillery of the forts, to which she was also exposed.

In the running fight which followed, until the "Teresa," "Oquendo," and "Viscaya" were destroyed, the "Indiana" gradually dropped behind, although she continued to fire until the last of the three vessels went ashore. The "Brooklyn" was ahead of any of the other American vessels on a course outside theirs; she was nearly broadside on to the Spaniards. The "Oregon," "Iowa" and "Texas" were all close together and actively engaged throughout this running fight. The "Brooklyn" and "Oregon," followed at some distance by the "Texas," then continued in chase of the "Colon," which went nearly thirty miles farther before she also went ashore. During this chase of the "Colon" there was practically no fighting.

These are the facts as set forth above in the statements of the captains, and elsewhere in their official reports and testimony. They leave no room for doubt on any important point.

The question of command is in this case nominal and technical. Admiral Sampson's ship, the "New York," was seen at the outset of the fight from all the other ships except the "Brooklyn." Four of these five ship captains have testified that they regarded him as present and in command. He signalled "Close in" to the fleet as soon as the first Spanish ship appeared, but his signal was not seen by any American vessel. He was actually under fire from the forts, and himself fired a couple of shots, at the close of the action with the torpedo-boats, in addition to signalling the "Indiana" just at the close of the action. But during the action not a single order from him was received by any of the ships that were actively engaged.

Admiral Schley at the outset of the action hoisted the two signals of "Clear ship" and "Close in," which was simply carrying out the standing orders of Admiral Sampson as to what should be done if the enemy's ships attempted to break out of the harbour. Until after the close of the first portion of the fight at the mouth of the harbour, and until after he had made his loop and the Spanish ships were fleeing to the westward, not another American ship noticed a signal from him. When the western pursuit had begun the "Oregon," and the "Oregon" only, noticed and repeated one of his signals of command. The captain of the "Oregon" then regarded him as in command, but did not in any shape or way execute any movement or any action of any kind whatsoever in accordance with any order from him.

In short, the question as to which of the two men, Admiral Sampson or Admiral Schley, was at the time in command, is of merely nominal character. Technically, Sampson commanded the fleet, and Schley, as usual, the western division. The actual fact, the important fact, is that after the battle was joined not a helm was shifted, not a gun was fired, not a pound of steam was put on in the engine-room aboard any ship actively engaged, in obedience to the order of either Sampson or Schley, save on their own two vessels. It was a captain's fight.

Therefore, the credit to which each of the two is entitled rests on matters apart from the claim of nominal command over the squadron, for so far as the actual fight was concerned neither one nor the other in fact exercised any command. Sampson was barely more than technically in the fight. His real claim for credit rests upon his work as Commander-in-Chief; upon the excellence of the blockade; upon the preparedness of the squadrons; upon the arrangement of the ships, head on, in a semicircle around the harbour, and the standing orders in accordance with which they instantly moved to the attack of the Spaniards when the latter appeared. For all these the credit is his.

Admiral Schley is rightly entitled—as is Captain Cook—to the credit of what the "Brooklyn" did in the fight. On the whole she did well; but I agree with the unanimous finding of the three admirals who composed the Court of Inquiry as to the "loop." It seriously marred the "Brooklyn's" otherwise excellent record, being, in fact, the one grave mistake made by any American ship that day. Had the "Brooklyn" turned to the westward, that is, in the same direction that the Spanish ships were going, instead of in the contrary direction, she would undoubtedly have been in more "dangerous proximity" to them. But it would have been more dangerous for them as well as for her! This kind of danger must not be too nicely weighed by those whose trade it is to dare greatly for the honour of the flag. Moreover, the danger was certainly not as great as that which, in the self-same moment, menaced Wainwright's fragile craft as he drove forward against the foe. It was not in my judgment as great as the danger to which the "Texas" was exposed by the turn as actually made. It certainly caused both the "Brooklyn" and the "Texas" materially to lose position compared to the fleeing Spanish vessels. But after the loop had once been taken Admiral Schley handled the "Brooklyn" manfully and well. She and the "Oregon" were henceforth the headmost of the American vessels—though the "Iowa" certainly, and seemingly the "Texas" also, did as much in hammering to a standstill the "Viscaya," "Oquendo," and "Teresa"; while the "Indiana" did all her eastward position and crippled machinery permitted. In the chase of the "Colon" the "Brooklyn" and "Oregon" share the credit between them.

Under such circumstances it seems to me that the recommendations of President McKinley were eminently proper, and that so far as Admirals Sampson and Schley were concerned, it would have been unjust for him to have made other recommendations. Personally I feel that in view of Captain Clark's long voyage in the "Oregon" and the condition in which he brought her to the scene of service, as well as the way in which he actually managed her before and during the fight, it would have been well to have given him the same advancement that was given Wainwright. But waiving this, it is evident that Wainwright was entitled to receive more than any of the other commanders; and that it was just to Admiral Sampson that he should receive a greater advance in numbers than Admiral Schley—there was nothing done in the battle that warranted any unusual reward for either. In short, as regards Admirals Sampson and Schley, I find that President McKinley did substantial justice, and that there would be no warrant for reversing his action.

Both Admiral Sampson and Admiral Schley are now on the retired list. In concluding their report the members of the Court of Inquiry, Admirals Dewey, Benham, and Ramsay, unite in stating that they recommend that no further action be had in the matter. With this recommendation I most heartily concur. There is no excuse whatever from either side for any further agitation of this unhappy controversy. To keep it alive would merely do damage to the Navy and to the country.

THEODORE ROOSEVELT.

MILITARY NOTES.

PRINCIPAL APPOINTMENTS AND PROMOTIONS FOR MAY, 1902.

Brevet Colonel C. G. C. Money, C.B., from Lieut.-Colonel h.p. to be Colonel to command the 24th Regimental District (the South Wales Borderers). Brevet Colonel R. G. Bruxner-Randall from Lieut.-Colonel h.p. to be Colonel to command the 20th Regimental District (the Lancashire Fusiliers). Major-General Sir G. T. Pretyman, K.C.M.G., C.B., R.A., to command a First-Class District in India. Brevet Colonel G. H. Bingham, from Lieut.-Colonel h.p., R.A., to be a Colonel on the Staff for Royal Artillery in India, with the temporary rank of Brigadier-General whilst so employed, and to have the substantive rank of Colonel in the Army. Lieut.-Colonel and Brevet Colonel C. H. Kelly, 1st Provisional Battalion, is granted the substantive rank of Colonel in the Army. Lieut.-Colonel R. H. Quill, M.B., R.A.M.C., to be Colonel. General Nathaniel Stevenson to be Colonel of the Royal Inniskilling Fusiliers. Major-General and Hon. Lieut.-General W. Roberts, from the Royal Inniskilling Fusiliers, to be Colonel of the Gloucestershire Regiment. Colonel E. Dickinson, from A.A.G. for Royal Engineers, to be a Colonel on the Staff for Royal Engineers. Colonel (local Brigadier-General) H. E. Belfield, C.B., to be a Brigadier-General on the Staff whilst holding the appointment of Inspector-General of the Imperial Yeomanry, and to have the local rank of Brigadier-General whilst so employed. Major and Brevet Lieut.-Colonel H. G. Morgan, D.S.O., A.S.C., to be a Colonel on the Staff for Army Service Corps duties, and to have the local rank of Colonel whilst so employed. Major-General A. S. Wynne, C.B., to be D.A.G. to the Forces. Major-General C. W. H. Douglas, now Major-General on the Staff, Commanding an Infantry Brigade at Aldershot, to be a Major-General on the Staff to command a Division, 1st Army Corps. Major-General Sir H. McCalmont, K.C.B., now Major-General on the Staff commanding the troops in the Cork District, to be a Major-General on the Staff to command the 8th Division, 3rd Army Corps. Major-General E. P. Leach, V.C., R.E., now temporarily Major-General on the Staff commanding the troops in the Belfast District, is appointed temporarily Major-General on the Staff to command the 9th Division, 3rd Army Corps. Colonel the Hon. Sir F. W. Stopford, K.C.M.G., C.B., now a D.A.G., to be a Brigadier-General on the Staff whilst Chief Staff Officer of the 1st Army Corps, and to have the temporary rank of Brigadier-General whilst so employed. Colonel A. G. Wavell, C.B., now temporarily a D.A.G., is appointed temporarily a Brigadier-General on the Staff whilst Chief Staff Officer of the 3rd Army Corps, and is granted the temporary rank of Brigadier-General whilst so employed. Brevet Colonel R. J. F. Banfield, C.B., from Lieut.-Colonel h.p. to be an A.A.G., and to have the substantive rank of Colonel in the Army. Lieut.-Colonel E. S. E. Childers, R.E., to be Colonel. The undermentioned

officers who are holding appointments as Inspector-Generals of Supply and Transport in India are granted the substantive rank of Colonel in the Army, viz. :—Lieut.-Colonel and Brevet Colonel H. C. E. Lucas, I.S.C., Lieut.-Colonel G. Wingate, C.I.E., I.S.C., and Lieut.-Colonel H. M. P. Hawkins, I.S.C. Lieut.-Colonel W. S. Pratt, M.B, R.A.M.C., is granted the local rank of Colonel whilst acting as P.M.O. at Gibraltar. Lieut.-General T. Kelly-Kenny, C.B., to be Colonel of the Queen's (Royal West Surrey Regiment). Major-General and Hon. Lieut.-General G. G. C. Stapylton, from the Queen's (Royal West Surrey Regiment), to be Colonel of the Duke of Cornwall's Light Infantry. Brevet Colonel J. M. Hunt, from Lieut.-Colonel h.p. to be Colonel to command the 91st Regimental District (Princess Louise's Argyll and Sutherland Highlanders). Lieut.-Colonel E. J. Gallwey, C.B., from the Prince Albert's (Somersetshire Light Infantry), to be Colonel to command the 13th Regimental District (the Prince Albert's Somersetshire Light Infantry). Major-General Sir H. M. L. Rundle, K.C.B., K.C.M.G., D.S.O., R.A., to be a Major-General on the Staff to command the 5th Division, 2nd Army Corps. Major-General H. H. Parr, C.B., C.M.G., from Major-General on the Staff commanding the troops at Shorncliffe, to be a Major-General on the Staff to command the troops in the North-Western District.

HOME.—*New Type of Air-Ship.*— We are indebted to the courtesy of the Editor of *Engineer* for the following description and accompanying blocks :—

Dr. Barton, who has been carrying on experiments in aërial navigation for about twenty years, constructed his first model about 10 feet long, consisting of a cigar-shaped balloon mechanically driven by means of stretched rubber bands working a propeller about 6 inches diameter. The second attempt was made with a machine 4 feet 6 inches long, which consisted entirely of aëroplanes, having two vertical planes for steering and two horizontal planes for supporting the machine and raising and lowering it as required. Although this machine was a failure like the first, the results of his experiments prompted him to try a combination of the two; accordingly he set about making the third air-ship, employing movable aëroplanes, interposed between the balloon and a suitably constructed frame for carrying the clockwork train driving the fan. This model was 21 feet long; it was shown in the Public Hall at Beckenham in 1899, when it proved not only its ability to steer, but to be capable of going up or coming down as required: but it must be remembered this was indoors, where there was no wind. The inventor now constructed his fourth air-ship on a larger scale, the object aimed at being the production of an air-ship capable of rising and falling without the expenditure of either gas or ballast. This ship was 35 feet long, and its general design is shown in Fig. 1, by which it will be seen that the balloon part was cylindrical, with tapered ends. The upper portion was covered with network, from which was suspended a framework carrying the aëroplanes, aëroplane sectors, and rudder. The car, provided with wheels, and containing the clockwork and propeller, was suspended under all. The aëroplanes extend from the front of the frame, where they pivot, to the sectors, which sectors, it will be observed, are struck from a point some distance from the pivot, the object being to expose a curved surface to the air, experiments having shown that much better results are thus attained. The aëroplane in Fig. 1 is set for rising, and is shown by a curved line. Should, however, the balloon be required to move horizontally, the aëroplane end is moved by the centre of the sector, in which position it will be stretched flat, and thereby offers no resistance to the air. However, this method of curving the aëroplanes was found in practice to be clumsy and difficult to work, hence the system as shown in Fig. 2 was adopted. It

will be seen that the sector is dispensed with and links substituted; the links are pivoted at the point where the sectors were struck, and thus described the arc shown by dotted line. The clockwork train was not nearly powerful enough, only weighing 4 lbs. This balloon was tried in the open on 12th May, 1899, at Beckenham. There was a gentle breeze blowing, but too strong for the clockwork. The first experiment was as a captive balloon, for the purpose of testing the lifting capacity, etc., in the direction of the wind, its course being shown by a dotted line in Fig. 3—sketched from an Ordnance map—the starting-point being denoted by a black disc, and the landing point by a black disc enclosed in a circle. The direction of the wind is shown by arrows. In the second experiment the clockwork was wound up to the fullest extent,

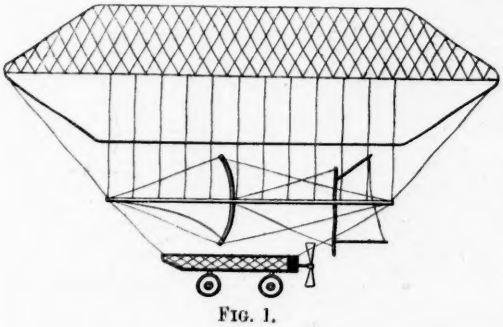


FIG. 1.

FIG. 2.

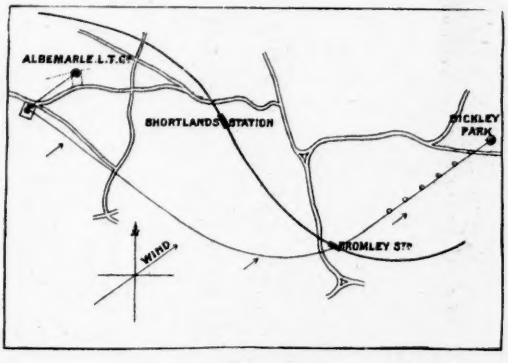
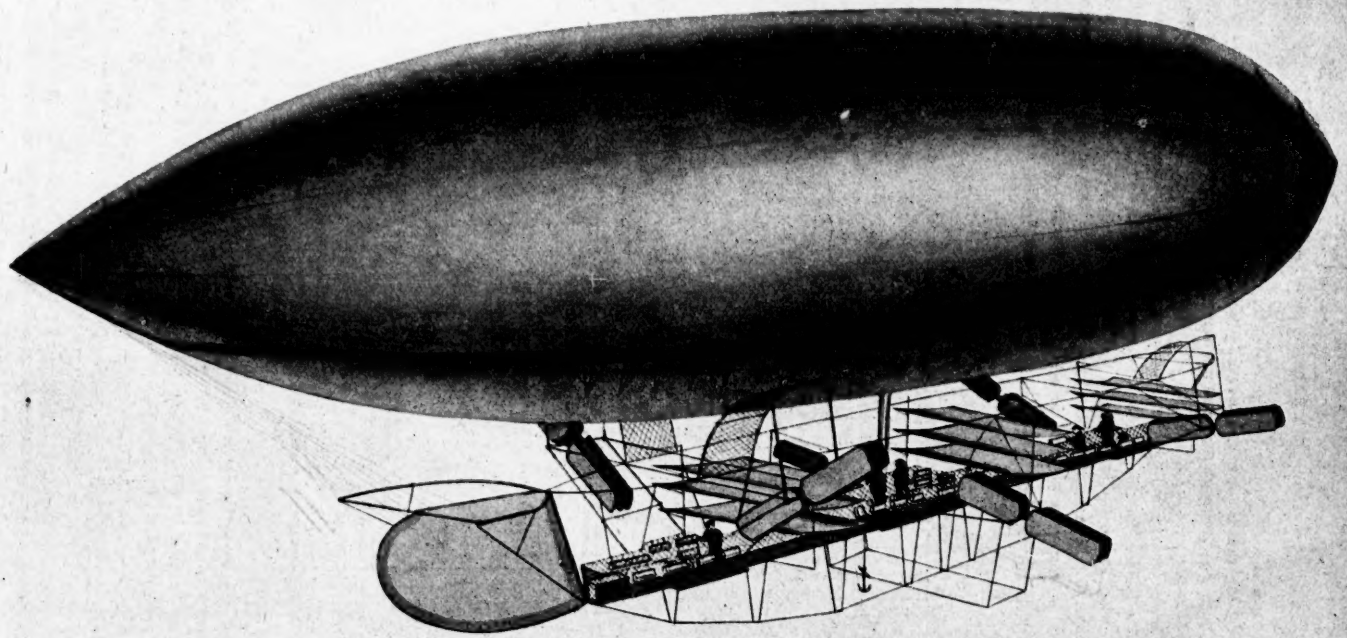


FIG. 3.

the aëroplane was then set so as to cause the balloon to ascend, and the rudder was put to "port," so as to steer the balloon across the wind. Having opened a small hole in the top, in order to allow the balloon only a short run, it was cut adrift. Although there was but little lifting power in the balloon, the action of the aëroplane caused it to ascend as it gathered way, and in ten minutes it had reached an altitude estimated by onlookers at 800 feet to 1,000 feet; it kept perfectly level and steered well, sailing straight away across the wind, the course being shown on the map by a fine line, nearly at right angles to the wind. In about fifteen minutes the propeller ceased to revolve, when a most noticeable change took place, and the balloon, after having passed



over Bromley Station, began to turn round and round on its axis like an ordinary balloon, and drifted away down the wind, finally descending at Bickley Park, a distance of about 3½ miles, after a flight of twenty-three minutes.

On the principles herein described, and with the assistance of the best experts obtainable, an air-ship on the Barton system is now being built, the general design of which is shown opposite. The balloon, or sustaining part, is made in the form of a cigar, pointed at both ends, its largest diameter being about two-fifths from the front end, is 180 feet long, and 41 feet maximum diameter, giving a total capacity of 156,000 cubic feet; it is divided into compartments, the centre compartment containing a subsidiary balloon having a capacity of 12,000 cubic feet, reducing the lifting capacity proportionally. This will give a total lifting capacity—for 144,000 cubic feet—of 10,080 lbs. Ordinary balloons filled with very carefully made hydrogen gas will lift 1,200 grammes per cubic metre, but it is not safe to calculate upon more than 1,000, as the quality of gas varies so much. With coal gas the lift is 730 grammes for a good quality and 700 for medium. It is found in practice that there exists a great necessity for preserving the external shape, especially of a cigar-shaped balloon, as has been practically demonstrated lately. In the balloon now described this difficulty will be greatly reduced, as no gas is expended for descending purposes, and it may, therefore, reasonably be expected to remain in the air for a very long period. The subsidiary balloon is filled with air, so that when the reduction of pressure from the ascension of the air-ship, or from the heat of the sun's rays causes the gas to expand, the air is driven out; and on the gas again contracting, air is pumped in. This plan has been, of course, used by many experimenters, the latest of whom is M. Santos Dumont. The entire upper surface of the balloon proper is enveloped in an extra casing or chemise provided with cane stiffeners; from this chemise the car and its superstructure are suspended – the suspending cords are not shown. The superstructure is made of steel, mostly of tubular section, and is constructed to carry the propellers, aëroplanes, and rudder. The ship is to be propelled by six two-bladed triple fans, three on each side of the superstructure. It will be observed each pair of fans is centred on a different plane to the others, in order that each shall revolve and pass through different air. The balloon is protected from the fans by network screens. Each pair of fans will be driven by an oil motor, with electric ignition, each motor exercising 45 brake H.P. Experiments recently carried out at Mr. Alexander's experimental works at Bath show that a thrust of 25 lbs. per brake H.P. can be obtained without excessive weight. However, in this instance, the thrust is taken as 20, giving a total of 2,700 lbs. for the six fans. There are three sets of aëroplanes, each set consisting of three, one over the other, each aëroplane having a rod in front for the pivot and a rod in the rear for raising and lowering the end by means of the links—as shown in the diagram Fig. 2. By means of these aëroplanes the ship will be raised to any desired altitude above the point to which it would naturally rise by means of the lifting power of the balloon, and failure of the mechanism can result in nothing more than its returning to its original point, which will be 1,000 feet above the ground. The deck, on which the crew can freely walk about, is floored with a light matting, and is provided with a hand-rail and netting; the fan motors are fixed to this deck, and in order that the deck shall remain always in a horizontal position, a water tank is placed at each end, each tank containing about 50 gallons of water, which is kept, by means of a pump and connecting pipes, in a constant state of circulation. There is also a pendulum-operated valve arranged so that, should one end of the deck drop, the pendulum shuts off the water from the lower end and pumps it to the upper tank till the level of the deck is restored.

The total weight to be lifted is estimated as follows :—

	lbs.
Envelope with chemise and attachments	1,900
Subsidiary balloon	140
Five men	800
Motor spirit 216 gallons	1,460
Six 17-foot fans	500
Three 45 brake H.P. engines	1,150
Deck, superstructure, and aëroplanes	3,500
Instruments, goods, clothing, and sundries	150
Total	9,600

The maximum area of the balloon is 1,320 square feet. According to Rouse and Smeaton's experiments, the air resistance of a flat surface, at 13 miles per hour, is just under 1 lb. per square foot. Professor Langley's more recent experiments, which have been verified by others, show that the amount is excessive. The pressure is largely reduced if the object piercing the wind is in the form of a cone, and the resistance is variously given as from one-third to one-fifth of a flat surface. Now if these *data* are taken, and only one-third is allowed for the reduction in resistance through the shape of the body of the balloon, the resistance is under 450 lbs. To this has to be added the resistance of the aëroplanes, superstructure, car, and its contents, and the surface friction of the sides of the balloon, etc., say 250 lbs., giving a total resistance of under 700 lbs. Now, as the thrust available is estimated at 2,700 lbs., it is not unreasonable to expect a speed exceeding 20 miles per hour. It has been stated by those present when Dr. Schwarz's aluminium balloon was tried, that until the first driving belt came off it advanced against a breeze blowing at a steady rate of 19 miles per hour. This air-ship had only 12-H.P. and two 6-foot 6-inch propellers, whilst its size was nearly as great as that just described herein, namely, 147 feet long and 46 feet by 39 feet diameter, its shape being elliptical, with a capacity of 130,500 cubic feet. It is understood that should this air-ship prove successful it is to be purchased by the Government.

INDIA.—*The Changes in the Madras Army.*—Orders regarding the mustering out of four Madras infantry battalions are published. The 8th Madras Infantry, which is to be designated the 8th Gurkha Rifles, and linked with the 10th Gurkha Rifles, will be mustered out at Rangoon, the new regiment being raised at Thayetmyo. The nucleus of the new battalion will consist primarily of selected volunteers from the 10th Gurkha Rifles and the Gurkha battalions of the Burma Military Police, the number from the Police being limited to 100; but specially recommended men of other Gurkha regiments, if of suitable classes, will also be eligible for transfer thereto. All ranks so transferred will travel at public expense. The battalion will be completed by Gurkha recruits drawn from Eastern Nepal and will be ordinarily stationed in Burma. The organisation, establishment, and strength of the reconstituted battalion will be the same in all ranks, British and Native, including followers, as that of the 10th Gurkha Rifles. Former service in the Army and Military Police will count towards pension and service required for the grant of good conduct pay and pension.

The 2nd, 6th, and 24th Madras Infantry, as at present constituted, will be mustered out at Fyzabad, Nowgong, and Secunderabad respectively, and to replace them class company regiments bearing the same designations will be formed at those stations. The three reconstituted regiments will be linked together so as to form a three-battalion group with its regimental centre at Secunderabad, and will each have

the following class constitution :—4 companies Punjabi Mussalmans, 2 companies Jat Sikhs, 2 companies Rajputs.

The nucleus of each regiment will consist of 200 transfers to be drawn from such Punjab, Bengal, Burma, and Bombay Infantry regiments as recruit the classes named. The Punjabi Mussalmans to be enlisted will, as far as possible, be taken from the following tribes, viz., Sattis Dhunds, Sudhans, Dharrials, Ketwals, Mishwanis, Tanaolis. The Sikhs will be short men of the Jat tribes of Malwa ; the Rajputs will be short men of the clans found in Northern and Eastern Rajputana and the Eastern districts of the Punjab. The minimum physical standard required of recruits will be as follows :—Height, 5 feet 4 inches to 5 feet 8 inches ; chest, 32 inches ; but growing lads who show promise of further development may be accepted with a smaller chest measurement at the discretion of the approving officers. Recruiting will be carried out regimentally and by a recruiting staff. The officers of each of the regiments under reconstruction will be allowed to detach two British officers at a time on recruiting duty until they are up to strength, to facilitate recruitment.

The Government of India sanction the bestowal of four Jemadar's commissions in each regiment on native gentlemen of good family of the classes named, provided they can each bring for enlistment 50 approved recruits.

The organisation, establishment, and conditions of service of the reconstituted battalions will, for all ranks, British and Natives, including followers, be those authorised for the infantry battalions of the Punjab and Bengal commands. No special privileges and concessions, which are applicable to Madras troops only, will be granted them. The strength will be that now laid down by the Madras Infantry battalions. The uniform will be red and green facings. The obligatory language will be Punjabi. All the regimental funds of the four regiments mustered out will be taken over by, and remain the property of, the reconstituted battalions.

As regards the present 2nd, 6th, 8th, and 24th Madras Infantry, a specially selected officer will be appointed to assist the General Officers Commanding Districts in making careful selections of the men now serving. All individuals whose retention in the Service is from any cause considered undesirable will be noted for discharge. Men passed as fit for further service will be allowed to volunteer for the 1st, 3rd, 4th, 5th, 13th, 15th, 19th, 20th, 21st, 23rd, 26th, and 28th Madras Infantry, or for the reserves of the same, provided the fixed establishments are not exceeded. Men not volunteering for the regiments named, and men who volunteer, but for whom vacancies cannot be found, and men rejected as unsuitable for retention in the Service, will be discharged on the following terms :—To native officers, non-commissioned officers and men of 25 years' service and upwards, the superior rate of pension ; ditto, over 15 and less than 25 years' service, ordinary rate of pension ; ditto, more than 10 and less than 15 years, two-thirds of the ordinary rate of pension. These pensions will be granted irrespective of service in rank and will carry rice compensation. Officers and men of between 5 and 10 years' service will receive a gratuity of one month's pay for each year of service, with the option, if selected, of transfer to the regiments named. Those with less than 5 years' service will get a gratuity of three months' pay with a similar option. Followers will receive the ordinary rate of pension or gratuity. Recruits and pension boys will be given the option of discharge or transfer to other regiments. Free passages by rail will be given to all ranks in case of discharge. The certified cost of any change of uniform, half mounting, or equipment, entailed by the reconstitution of the regiment, or through transfers, will be allowed to all individuals concerned, including British officers, irrespective of rank. The amount of compensation in the case of British officers will not exceed Rs.500 in each case.—*Pioneer Mail.*

MOROCCO.—*The Morocco Army.*—According to the *Revue Militaire de l'Etranger*, Morocco is divided into three large commands, that of Fez, that of Morocco, and that of Tafilet. In 1883 these commands were each exercised by a brother of the Sultan. Immediately subordinate to the governors were the caïds of provinces. A correspondent writing recently to the Russian journal the *Novoé Vrémia*, states that military service in Morocco has been obligatory since the battle of Isly; the defeat of the Moors by General Bugeaud, on that occasion, demonstrated to the Sultan the vital necessity of having a proper military organisation. The *Revue Militaire de l'Etranger*, however, thus explains the situation: "The caïds recruit one soldier from each family, the head of the family can, however, purchase the exemption of his son. This purchase is only valid in peace-time, the man being obliged to march with his battalion when it takes part in an expedition. Soldiers join the ranks very young and remain in them until they are no longer fit for service. Exchanges between members of a family are permissible. These exchanges and purchases give rise to many abuses; and one frequently sees in the ranks of the Army children who are barely capable of carrying arms."

Being in constant touch with the chiefs of the Moroccan Army, the correspondent of the *Novoé Vrémia* has been able to gather some interesting information with regard to the officers. According to him, a certain number of the latter are so well trained that they would not be out of place in any European Army. He has met with Moroccan officers who have studied at Guadaljara, Toledo, Brussels, and Berlin. Some officers speak French and German, but a greater number speak the Spanish language, which comes more readily to them. During their stay in military schools these officers wear European dress, are received everywhere, and are in no respect behind their comrades as regards training and education. But, on their return to Morocco, where they reclothe themselves in the national costume, they at once resume their former habits, and become once more pure Moroccans, with a more profound contempt than ever for Europeans and for Christians. In spite of their training in European military schools these officers are not much thought of in the Moroccan Army, where they seldom attain to the higher ranks. As a rule, all billets and promotions are awarded personally by the Sultan, who thus rewards either the members of the Imperial family who have gained his confidence, or other chiefs who are in his favour. Frequently a Moroccan, who has passed all his life in some State office is suddenly raised to general's rank and placed at the head of an expedition.

The Regular infantry, at the present time, consists of 19 *tabors*, 16 of which remain near the Sultan, and the remaining 3 garrison Sus and Marakesch (Morocco). The infantry, now taking part in the expedition against the Beni-Messara, consists of about 10,000 men, have been furnished by the first 16 *tabors*. According to the *Revue Militaire de l'Etranger*, the *tabor*, which varies from 200 to 1,000 men, is the real unit; it is commanded by a *caïd-agha* assisted by a *khalifa*, and is divided into companies of 100 men each under a *caïd-mia*. Each company has its own banner. The *caïd-agha* and the *caïd-mia* are the only two ranks of officer. The *mokaddem*, immediately inferior to them, corresponds to a non-commissioned officer; the sergeant-major, when there is one, is called a *bach-chaouch*. The *Revue Militaire de l'Etranger* expresses itself as follows on the subject of the clothing: — "The regulations are not strict either as regards the uniform or the method of wearing it. It is not unusual to see in the ranks men naked down to the waist, carrying their coats on the head to keep the sun off; others again are barefooted or bareheaded; some, too, are clad in old red tunics, which come from Gibraltar. Altogether the clothing has a melancholy appearance."

The defence of the ports is entrusted to special detachments, placed under the direct orders of the governors of these ports. The total strength of these detachments is about 3,000 men. The correspondence of the *Noroé Vrémia* says but little about the Moroccan cavalry, which, according to him, has only 1,000 horses. The *Revue Militaire de l'Etranger*, however, states that the Regular cavalry in 1883 was furnished by the *Maghzen* tribes, who enjoyed certain immunities from taxation. Its strength at that date was 2,000 men. The artillery, according to the Russian correspondent, consists of 7 companies of 100 men each. There is only 1 company of engineers. The artillery is armed with all sorts of guns of various models; thus, according to the Russian correspondent, there are at the present time eight Krupp 75-millimetre guns, four mountain guns from Belgium, a Whitworth mountain battery, and some Gatling, Hotchkiss, and Montigny machine guns. The cavalry is armed with Winchester carbines and swords. The Government has for the armament of the Regular Army :—10,000 Belgian Werder breech-loading rifles, 10,000 Martini-Henry rifles, 2,000 Winchester, as well as a few thousand Mauser and Lee-Enfield rifles. "It is not unusual," says the Russian journal, "to see in the same *tabor* a magazine rifle of the most recent pattern side by side with an old flint-lock."

In addition to the Regular Army, there are some military tribes whose organisation greatly resembles that of the Cossacks. The men of these tribes are employed on confidential missions, and are entrusted with the escort of strangers into the interior of the country. They form a kind of field police and enjoy a certain prestige. In the event of a general mobilisation these tribes can put 40,000 men in the field. The total effective of the Regular Army is thus about 15,000 men in peace-time. If to this number is added the men from the military tribes and the Kabyles, a total of 70,000 is arrived at. A *levée en masse* would furnish, according to the *Revue Militaire de l'Etranger*, 350,000 men, and, according to the correspondent of the *Noroé Vrémia*, 500,000. Such, in its general lines, is the military organisatian of Morocco.—*Revue du Cercle Militaire.*

RUSSIA.—*Manœuvres for 1902.*—The programme for the various assemblies of troops, and that of the Grand Manœuvres for the current year, have just been laid down as follows for all the military districts :—

St. Petersburg Military District.

The Guards Corps, the 2 divisions of the XVIIIth Army Corps, and the 50th Reserve Infantry Brigade will assemble, in the middle of July, at the camp of Krasnoé Selo. These troops, consisting altogether of 76 battalions, 50 squadrons or sotnias and 43 batteries, will take part in a mobile muster from 14th to 23rd August in the Tsarskoe Selo and St. Petersburg districts, under the general supervision of the officer commanding the Guard troops and the St. Petersburg Military District. The 37th Infantry Division and the 85th (Viborg) Regiment will undertake the guard duties in St. Petersburg and the neighbourhood.

Finland Military District.

In consequence of the re-organisation and the augmentation of the troops of this district, the latter, instead of assembling, as in preceding years, at the camp of Krasnoé Selo, will assemble at the Vilmanstrand and Viéroumski camps. This year, however, only the 2nd, 6th, and 8th Finland Rifle Regiments, as well as the Finland Dragoon Regiment, and 2 batteries of the Finland Artillery Regiment will muster at the camp at Vilmanstrand.

Vilna Military District.

With the exception of the 25th and 30th Infantry Divisions, all the troops will take part in the mobile musters. The troops from the camps at Grodno, Orany, Vilna, and Kovno (54 battalions, 31 squadrons, and 33 batteries) will, after these mobile musters, carry out grand manœuvres lasting for six days, from 2nd to 7th September. The General Idea of these manœuvres will be the forcing of the passage of the Niemen below Grodno. The attacking force will have 2 pontoon battalions at its disposal. In addition, after the mobile musters, the 2nd and 3rd Cavalry Divisions will execute special manœuvres for a period of eleven days.

Varsovie Military District.

Half of the troops will take part in the mobile musters, and the whole will then carry out grand manœuvres for a period of six days, from 6th to 11th September. The Eastern (attacking) Force, commanded by General Lermantov, Chief of the 1st Army Corps, will consist of 80½ battalions, 78 squadrons, 240 field and 30 horse artillery guns, and 2 pontoon battalions. The Western Force, commanded by General Weis, Chief of the XVth Army Corps, will consist of 59 battalions, 47 squadrons, 196 field and 16 horse artillery guns. During the month of September the whole of the cavalry will execute special manœuvres, lasting for four weeks, for the reservists not taking part in the above-mentioned manœuvres, and one of three weeks for the others.

Kief Military District.

The troops of this district selected to take part in the Grand Imperial Manœuvres of the Koursk Government are as follows:—The Xth Army Corps, with complete effective; the 3rd Rifle Brigade with its group of batteries; the 7th and 14th Engineer Battalions; 2 companies of the 5th Engineer Battalion; the 4th Transport Battalion Cadre. All the other troops will take part in the mobile lasting for during two weeks. In addition, these musters of the XIth and XIIth Army Corps (72½ battalions, 50 squadrons, and 35 batteries) will conclude with manœuvres lasting for three days, from 9th to 11th September. The 12th Cavalry Division and the 2nd Mixed Cossack Division (48 squadrons and 24 guns) will carry out special manœuvres from 29th July to 18th August.

Odessa Military District.

The 15th and 34th Infantry Divisions, the 4th Rifle Brigade with its artillery, altogether 40 battalions, and 19 batteries will take part in the Grand Imperial Manœuvres. The remainder of the troops will carry out landing manœuvres between Odessa and Otchakov.

Moscow Military District.

The Moscow Army, taking part in the Koursk Grand Imperial Manœuvres, will consist of: the XIIIth and XVIIth Army Corps, with their effectives complete, with the exception of the troops necessary for the carrying out of guard duties; the 1st Cavalry Division with its artillery; the 13th and 17th Engineer Battalions; 1 company of the Grenadier Battalion; altogther 66¾ battalions, 36 squadrons, and 41 batteries. The Moscow Army will be reinforced by the 5th Rifle Brigade with its artillery and by the 2nd Transport Battalion Cadre, furnished by the Vilna Military District.

Caucasus Military District.

The troops (51 battalions, 50 squadrons, and 30 batteries) will only take part in the mobile muster from 16th to 29th September.

Turkestan District.

These troops (12 battalions, 7 sotnias, and 5 batteries) will take part in a mobile muster in the neighbourhood of Taschkent, from 14th to 27th September.

Transcaspian District.

The troops of this district (8 battalions, 9 sotnias, and 5 batteries) will all take part in a mobile muster, near Askhabad, from 14th to 27th September.

It will thus be seen that, speaking generally, the troops taking part in the Koursk Grand Imperial Manœuvres will consist of 4 complete army corps, viz., the Xth, XIIIth, and XVIIth Army Corps, 2 infantry divisions, and 2 brigades of rifles.—*Revue du Cercle Militaire.*

CORRESPONDENCE.

A REPLY TO LIEUT.-COLONEL MAYNE'S CRITICISM ON "CONTINENTAL *v.* SOUTH AFRICAN TACTICS," BY LIEUT.-COLONEL MAUDE.

To the Editor of the JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION.

SIR,—Colonel C. B. Mayne seems to have missed the whole drift of my lecture. I wished to establish a comparison between the risks which have to be incurred nowadays in crossing a fire-swept zone and those which our ancestors used to face before us.

For this purpose I drew attention to the fact that for the last two hundred years or so every line of battle has been formed with so many men to the yard, that as long as these men remained capable of aimed fire, all assaults on their front were bound to fail. But no leader ever attempted to attack such a fire wall until by skirmishing fire, artillery fire, or both, he had reduced the steadiness and aiming capacity of his foe to such a degree that their bullets no longer sufficed to keep back the rush. If the attempt was made too soon, it failed then as it would fail now. Success followed as a consequence of the leader's skill in the use of his means for preparing the attack and his judgment in the choice of the right moment. The more completely the enemy was shaken, the nearer his fire approached to the limit of being entirely random, *i.e.*, unaimed.

Now for many years past we have been taught in this country that against troops with modern arms a direct attack is terribly costly, the slaughter too terrible to be faced, and so forth, and to destroy this delusion I adopted the following line of reasoning. Fire in action is never altogether "aimed" or altogether "unaimed." If it approximates to the former condition, failure in attack is inevitable, whatever the weapons, ancient or modern, but the nearer it gets to the latter the less will the losses be. Accordingly, I analysed the conditions produced during a certain short limit of time by the discharge of a given number of rifles or muskets under identical conditions of unsteadiness in the firers, unsteadiness so great that the bullets are in both cases dis-

tributed at random, like shot from a shot gun or dried peas flung by the hand, where there is no idea of "grouping" whatever.

This analysis showed, of course, that for each class of weapon the divergence of the bullets increased as some function of the square of the range, which point Colonel Mayne concedes. But comparing the two classes of weapons with very different initial velocities it is obvious that the bullets are increasing their actual distance from one another, not only measured transverse to the range, but along it. Thus after, say, one second of time the old smooth-bore ball would have gone only 300 yards, the new Lee-Metford bullet, say, 600. This introduces a third factor into the case, viz., "time of flight," and this again varies directly as the range, so that we get back to my original formula that the number of bullets to a unit of cubic space must vary as some function of the cube of the range.

There are two distinct cases, symbolised by my small cake (*a*) and my large cake (*b*), and it is obvious that with the same number of currants, *i.e.*, bullets in each case, one's chance of meeting a bullet in a slice of (*a*) is very much greater than in a slice of (*b*). From this it is easy to find out how many currants must be used in cake (*b*) to bring their frequency up to those in (*a*), and converting the currants into bullets we find that with modern extended formations, no military weapon can attain the rate of fire required, even if the ammunition supply were adequate.

What it all comes to is this: Troops formed for the attack of a position held in the old Frederician method and with the old weapons, knew that they must lose, say, 20 per cent. to carry it, and might be annihilated, according as their leader knew his work or not. Troops nowadays, storming a modern position, though they also run risk of annihilation, *may* get through without about, say, a 5 per cent. loss, if the moment for attack is happily chosen.

Moreover, the increase in range and power of both artillery and infantry, by increasing the weight of fire that can be poured upon any predetermined point, especially a flank, enables the leader nowadays to ensure with greater certainty the degree of unsteadiness in the enemy's fire. It is more difficult to see the effect of one's practice nowadays, but it is not ocular vision which counts, but that higher power of genius which enables a born leader, like Napoleon, to read and balance the resultant will-power of the contending forces in his mind.

If when the attack is fairly launched, the attacking troops find themselves followed by the enemy's aim, as Colonel Mayne suggests, then the fire is not unaimed. The work of preparation is inadequate. This was the case in the first attempt on St. Privat, with the result we all know. But this is the only case I have ever heard or read about in which the French fire actually was under control. Generally it lashed the whole ground, and skirmishers, supports, and reserves came in for it equally.

Colonel Mayne further objects to my using the rate of loss per hour as a measure of the intensity of the fighting. In this I am only following a host of modern writers, who simply use this measure as a rough but more satisfactory generalisation than the usual one of taking the losses in whole battles, irrespective of their duration. I might have chosen typical attacks sufficiently alike in their general circumstances to be reasonably comparable, but this would make things worse for the present day. When formerly an attack meant a rush of, say, 300 yards, perhaps 50 per cent. of the stormers fell in a few minutes. The excitement and strain on the nerves must have been much greater than in such a one, for instance, as the St. Privat, attack which lasted at least three hours, and cost only 30 per cent.; or even than that of the 38th Brigade at Mars la Tour, which lasted, according to Hoenig, 90 minutes, and cost 47 per cent.

As to the formula I used, viz., that "after a certain number of rounds varying with the training of the troops was exceeded, the hits began to fall off inversely as the square of the number of rounds fired," I regret I cannot give him the reference, as the book is packed up in store and inaccessible, but my recollection is very distinct and my experience with raw troops confirms it.

Finally, let me ask Colonel Mayne, if my method is not correct, how else does he account for its extraordinary agreement with recorded figures? How was it, for instance, that with the old musket, French and English squares alike were impervious to the charge of Mamelukes, Turks, Sikhs, and Beloochees? How was it that at Meannee, for instance, every musket on the ground killed three and wounded six of the enemy? Whereas nowadays we have instances, such as Isandlwhana, Maiwand, Ahmed Khel (a very near thing), Tamai, Abu Klea, etc., to explain away, to say nothing of Vlakfontein and other more recent experiences.

The men are the same, probably much better, but the weapons and the drill have changed. If the modern weapon is the fetish we have made of it, what must have become of the discipline?

F. N. MAUDE,
Lieut.-Colonel,
late R.E.

NAVAL AND MILITARY CALENDAR.

MAY, 1902.

1st (Th.) 27th and 28th Bns. Imperial Yeomanry left England for South Africa on the "Plassy."

2nd (F.) H.M.S. "Aboukir" left Portsmouth for Mediterranean.

3rd (Sat.) 3rd Bn. Northamptonshire Regiment (Militia) arrived at Cape Town from England on the "Harlech Castle."

5th (M.) H.M.S. "Vengeance" left Portsmouth for Mediterranean.

" " 3rd Bn. Royal Scots (Militia)
" " 3rd Prince of Wales's Leinster Regiment (Royal Canadians) (Militia)
} Left South Africa for England and Ireland on the "Canada."

6th (T.) H.M.S. "Bulwark" left Plymouth for Mediterranean.

" " H.M.S. Amphitrite" left Portsmouth for China.

" " H.M.S. "Sutlej" commissioned at Chatham for Channel.

" " H.M.S. "Theseus" and "Rupert" arrived at Plymouth from Mediterranean.

" " 2nd Bn. Cameron Highlanders arrived at Crete from Gibraltar on the "Carthage."

7th (W.) Lord Kitchener reported that 231 Boers had been killed or captured in a drive in the Orange River Colony.

" " 2nd Bn. Loyal North Lancashire Regiment left Crete for Gibraltar on the "Carthage."

8th (Th.) Lord Kitchener reported that an armoured train had been derailed near Pretoria, and that an officer and 10 men had been killed and 11 men injured. He also announced that 34 Boers had been captured in the Pieresburg district.

8th (Th.) 29th, 30th, and 32nd Bns. Imperial Yeomanry left Ireland and England for South Africa on the "Bavarian."

9th (F.) 750 men and horses, 4th Canadian Contingent, left Halifax for South Africa on the "Cestria."

" " 4th Bn. Chester Regiment (Militia)
3rd Bn. West Riding Regiment (Militia)
Detachment 3rd Bn. West Surrey Regiment (Militia) } Arrived at Southampton from Cape Town on the "Britannic."

10th (Sat.) 750 men and horses, 4th Canadian Contingent, left Halifax for South Africa on the "Winifredian."

12th (M.) 4th Bn. Royal Garrison Regiment left England for Malta on the "Borneo."

13th (T.) 3rd Bn. Yorkshire Regiment (Militia)
4th Bn. Somersetshire L.I. (Militia) } Arrived in England from South Africa on the "Sicilia."

" " 3rd Bn. Northumberland Fusiliers arrived at Antigua from England on the "Atrato."

14th (W.) H.M.S. "Astræa" arrived at Plymouth from Mediterranean.

" " 33rd and 34th Bns. Imperial Yeomanry left England for South Africa on the "Assaye."

15th (Th.) H.M.S. "Royal Oak" arrived at Plymouth from Mediterranean.

" " H.M.S. "Icarus" arrived at Sheerness from Pacific.

" " It was announced that a permanent British garrison was to be stationed at Lake Chad.

" " 4th Bn. North Staffordshire Regiment (Militia) left Cape Town for England on the "Manhattan."

16th (F.) 500 men and horses, 4th Canadian Contingent, left Halifax for South Africa on the "Corinthian."

17th (Sat.) Lord Kitchener announced that General Sir Ian Hamilton, in a drive on on the Bechuanaland blockhouse line, captured 400 prisoners, including 100 rebels.

" " 2nd Bn. Loyal North Lancashire Regiment arrived at Gibraltar from Crete on the "Carthage."

18th (S.) The Boer delegates concluded their conference at Vereeniging and journeyed to Pretoria.

19th (M.) The Victorian Companies Commonwealth Horse left Melbourne for South Africa on the "Manchester Merchant."

" " The Queensland Companies Commonwealth Horse left Brisbane for South Africa on the "Custodian."

20th (T.) General Brabant and Cape Colonial Detachment for the Coronation left South Africa for England on the "Guelph."

" " 4th Bn. Bedford Regiment (Militia) also left South Africa for England on the "Guelph."

21st (W.) H.M.S. "Sutlej" left Chatham to join Channel Squadron.

" " Fouché's laager at Stapleford was surprised and captured by the British.

" " 2nd Bn. Derbyshire Regiment left Malta for England on the "Carthage."

" " 4th Bn. Royal Garrison Regiment arrived at Malta from England on the "Borneo."

22nd (Th.) 5th (New South Wales) Bn. Commonwealth Horse left Sydney for South Africa on the "Columbian."

22nd (Th.) 5th Canadian Regiment left Halifax for South Africa.

" " 2nd Tasmanian M.I.
7th New Zealand Contingent
Details
} Left South Africa for Tasmania and New Zealand on the "Manila."

23rd (F.) 27th and 28th Bns. Imperial Yeomanry arrived in South Africa from England on the "Plassy."

24th (Sat.) Earl Roberts presented their first Colours to the 3rd Bn. Manchester Regiment at Aldershot.

25th (S.) 3rd Bn. the Prince of Wales's Leinster Regiment (Royal Canadians) (Militia) arrived in Ireland from South Africa on the "Canada."

26th (M.) 35th and 36th Bns. Imperial Yeomanry left England for South Africa on the "Sicilia."

27th (T.) H.M.S. "Challenger" floated out at Chatham.

" " 37th and 38th Bns. Imperial Yeomanry left England for South Africa on the "Orotava."

" " The South Island Bn. 10th New Zealand Contingent arrived at Durban from Lyttelton on the "Norfolk."

" " 3rd Bn. Royal Scots (Militia) arrived in England from South Africa on the "Canada."

28th (W.) H.M.S. "Thesus" paid off at Chatham.

" " H.M.S. "Warspite" arrived at Plymouth from Pacific.

" " Announced that Commandant Malan had been mortally wounded and captured.

" " 39th Bn. Imperial Yeomanry left England for South Africa on the "Britannic."

29th (Th.) 29th, 30th, and 32nd Bns. Imperial Yeomanry arrived in South Africa from England on the "Bavaria."

" " 3rd Bn. the King's Own Scottish Borderers (Militia) left Cape Town for England on the "Roslin Castle."

30th (F.) H.M. the King celebrated his birthday and presented their first Colours to the 1st Bn. Irish Guards on the Horse Guards' Parade.

" " 2nd Bn. Derbyshire Regiment arrived at Southampton from Malta on the "Carthage."

31st (Sat.) The British terms of surrender for the enemy in the field were agreed to and signed by the Boer delegates, and peace was assured after two years and eight months' campaigning.

FOREIGN PERIODICALS.

NAVAL.

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La Marine Française. Paris: 1st May, 1902.—"Practical Speed at Sea." "English Opinion on the Future of Submarines." "The *Rôle* of the Submarine in the Defence and Attack of the German Ports." "The Defence of the English Coaling Stations." "Petroleum in place of Coal." "The Case of the 'Goubet.'" "Foreign Naval Notes." 15th May.—"Fortress War at Sea." "Tripoli and Morocco." "The Distribution of the English Forces in case of War with France." "The Possible Importance of Ice-Breakers in Future Wars." "Foreign Naval Notes."

GERMANY.—*Marine-Rundschau.* Berlin: June, 1902.—"The Carrying Out of an Over-sea War of Invasion." "The French Mercantile Marine: the Sea Fisheries, and their Relation to the Power of the State." "The Defence of the Italian Coast Towns." "Do we need a Naval Experimental Station?" "The Coaling of War-ships." "Don Juan of Austria, as Admiral of the Sacred League and the Battle of Lepanto." Discussions:—"The Regulation of the Helm-Order Question: Education in Navigation in the German Navy." "A Glance at the Düsseldorf Exhibition." "The May Cruise of the First German Squadron."

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NOTICES OF BOOKS.

La Guerre de 1870-71. Parts I. to VI. July to 4th August. Issued by the Historical Section of the French General Staff. Paris, 1901.

The Official History of the Franco-German War of 1870, now being published by the Historical Section of the French General Staff, promises to be a work of quite exceptional military interest. The present generation hardly realises the stunning effect produced throughout Europe, and especially in this country, by the rapid succession of German victories and French defeats. For years the superiority of French administration over our own, as exemplified in the Crimea and the campaign of 1859 in Italy, had been dinned into our ears, and the characters of most of the French marshals as determined fighting men of the best type were well known and not likely to be forgotten by those who remembered Pélissier, Canrobert, and MacMahon, especially the conduct of the latter's division at the final assault on the Malakoff. Even in Prussia, Prince Frederic Charles had warned his countrymen to expect no easy task, and for years the French "offensive" and their system of infantry tactics dating back to the early victories of the Republic, had been the pattern on which all Continental Armies had endeavoured to model themselves, more particularly the Prussians, who after Jena would hear no more about the "line," and closed their eyes and ears to its successes in the Peninsula and at Waterloo (note especially Von Moltke's remarks on the British line in the Crimea).

The catastrophe came, and the public, led by the newspapers, were as usual pat with their solution. A plan of campaign, carefully studied in advance and thought out in its minutest ramifications by von Moltke, and a system of tactics carefully adapted to the new weapons by the same master mind, was the accepted formula, which all Europe was invited to accept on pain of succumbing to a similar fate. More thoughtful men preferred to reserve their judgment, for there are two sides to every question, and as the Duke of Wellington said after Waterloo: "After a great battle, truth lies at the bottom of her well and it takes twenty years to get her out."

The twenty years have brought many revelations, and their peculiarity has been that step by step these have upset each of our preconceived standing points, and have left the ultimate disturbing cause in still greater obscurity.

First Moltke destroyed the legend of a plan of campaign. "Only the Layman," he tells us, "expects to see in the development of a campaign the complete execution of a plan settled in advance in all its details."

From the same source we also learnt that not one of the early battles and engagements of the war had been fought either at the time, or place, or in the manner that the directing influence either expected or desired, and subsequently it became apparent that the troops throughout this initial period, fought without combination or design and not always in a manner to deserve unqualified praise for their conduct. (See Meckel's description of the field of Saarbruck, Boguslawski on the fighting in the

Niederwald at Woerth, and Hoenig's account of the battle of Gravelotte.) On the other hand, it became evident that the courage and endurance of even the rawest French troops were beyond praise, for they stood up to their punishment like men both at Weissenburg and Woerth,[1] and even Canrobert's scratch corps at St. Privat proved a harder nut than the Prussian Guard could crack unaided.

With such material local victory might have been hoped for, sufficient to have brought into the field both Austrian and Italian assistance, and, as the present publication makes abundantly clear, it was on this assistance that the Emperor's original resolution was founded.

On paper his hopes were well justified. Military negotiations with this object had been entered into some weeks previously, and a joint plan of operations had been drawn up and agreed upon by the Archduke Albert for Austria, La Marmora for Italy, and General Lebrun for France, and though the scheme violated every principle of the German school, arranging for movements and concentration months in advance, and at places which could not be attained without fighting several engagements, the fact of co-operation was to be counted on, always assuming a preliminary victory to the French arms.

It is on this point, why the effort to secure such a victory was never made, that the interest of these two volumes principally turns. The Emperor had reckoned without his War Office, which for years previously in the interests of economy and control had been centralising all administration and massing the mobilisation stores in one single central depôt. Some three years before the dangers of this tendency had been indicated, and orders to redistribute the *matériel* over a wider area had been issued, but this operation was still in progress when the war broke out, and tremendous confusion soon arose. This was intensified by want of a properly worked-out scheme of railway concentration. The railways indeed grappled with their share of the problem successfully, they could have carried even a greater load of traffic if the soldiers had understood the necessity of discharging each train as it arrived at its destination; but, for the want of this precaution, stations and sidings became congested and the block soon extended for miles back along the whole system, and already on 29th July the Emperor was compelled to renounce his plan of a vigorous offensive across the Rhine, principally because the horses for the pontoon trains—the essential element for the execution of his design—had been overlooked.

Taking the evidence now before us as a whole, there is nothing to justify the irresolute policy which was now pursued. The troops had arms in their hands and sufficient ammunition; and if they were deficient in drinking water-bottles, cooking

[1] At Weissenburg 4,900 French of all arms fought for six hours, and even after the loss of their commander broke off the fight and withdrew in good order after inflicting a loss of 1,540 on their enemies, which works out to about 1 German disabled for every 200 rounds fired; at Woerth 45,000 held 100,000 at bay for nearly 8 hours, killing and wounding 10,000 or 1 Prussian for 450 rounds. Canrobert's corps was deficient in its artillery and cavalry and short of cartridges both for infantry and guns; it had no entrenching tools and its ranks held a very large proportion of young soldiers and reservists. Yet notwithstanding that it had been heavily engaged and in a part ridden over at Rezonville, and that it occupied what Scherff himself admits to have been the weakest portion of the line for defence along the whole of the position, it held its ground until a more than two to one numerical superiority had been accumulated against it.

gear, and "flannel cummerbunds," men have taken the field before without these luxuries and lived on the enemy's country.

Considering the enormous importance of a first success, both from the point of view of internal politics and the effect a defeat must have had upon the fighting quality of the enemy, there can be no doubt what Napoleon I.'s decision would have been. He often struck with far greater disadvantages against him, and had his nephew possessed the same resolution, we can see now how far-reaching the results might have been. For bearing in mind the immense disparity in the conditions of armament and the facility the great range of the Chassepot gave to the French to fight on the offensive (they could choose their own range for the act of preparation), Moltke's predilection for the "defensive," and his arrangements to accept battle in a prepared position south of the defiles of Kaiserslautern, rendered a preliminary success almost a certainty, provided the blow was delivered not later than 4th August, which was easily to be accomplished, and if victorious, the difficulties of supply—the chief restraining factor—would have settled themselves, the French could have lived on their enemy's provisions, as they had often done before.

Want of reliable information as to the Prussian position is the usual excuse put forward for this failure to advance. Here again the evidence destroys the pretext. Actually the information was quite adequate had the Intelligence Department and the French marshals been able to appreciate its true meaning. On the whole they appear to have been actually better served than the Germans. But whereas the latter had a trained staff to sift every statement and sort each fact into its proper place in the puzzle, so that within a few days, notwithstanding the wild nature of the frontier rumours received (see Verdy du Vernois' "Events on the Frontier from 17th July to 2nd August"), they had completed an almost correct "*ordre de bataille*" for the whole French Army. The French had no central bureau to arrange and check their reports, and attached undue importance to rumours which a knowledge of the peace distribution of the German Army and of existing railway communications, must have shown to be quite immaterial.

The Germans certainly seem to have have done their best to mislead their enemy by spies and false rumours, but either they knew the gullibility of the French staff to a nicety, or presumed to an unjustifiable extent on its supposed ignorance. Two rumours in particular merit attention: the first referred to the concentration of an army of 100,000 men near Lörrach in the Black Forest not far from Schaffhausen, which a glance at the railway map would have shown to be impossible in the time; and the other to the gathering of 100,000 men near "Duttweiler," some 10 miles to the north-west of Saarbruck, an equal impossibility under the circumstances; and though both these rumours were forwarded by the officers on the frontier, noted as highly improbable, they were passed on higher and higher, and seemed to gather weight as they went along. Actually at the time mentioned there were no troops at all at either of these places.

Even when the nightmare of these two fictitious concentrations was removed, German corps were moved about from one place to another with the most reckless disregard of railway facilities either in direction or carrying capacity, nor is this to be wondered at when one finds a Corps Intelligence Staff begging for an up-to-date railway map of Germany to be forwarded to it. To a railwayman a last month's issue of the Continental Bradshaw—or its German equivalent "Hendschel" would have been practically sufficient. The want of topographical maps was quite extraordinary; days after the opening of hostilities, and when in England quite reasonable maps of the frontier districts could be bought on every bookstall and in every club and

mess-room, a good large scale-map, generally about $\frac{1}{2000000}$, was hung up for the members' information, topographical maps were being distributed by twos and threes to generals only. Finally, on the 30th July, 600 copies of a rough pen-and-ink scrawl, one cannot call it a map, entitled "Routes conduisant au Rhin," signed Abel, d'après Reymann, were sent to General Frossard for distribution. It was without scale, north point, hill shading, or heights, the names roughly written, and was about as inaccurate as it looked, and only took in the western section of the frontier (see p. 42, part 3), but this is all that the unfortunate Rhine Army had to issue orders upon or to interpret them by.

However, by the 31st July, the general idea of the German concentration was fully revealed, the Ist Army at or near Treves, the IInd still north of Kaiserslautern, the IIIrd between Mannheim and Landau, only weak outposts along the frontiers, and the author gives a very admirable summing up of the strategical situation, pointing out that in spite of all drawbacks the troops were fit to march and could have been thrown either upon the Ist Army with a numerical superiority of 2 to 1 or upon the IIIrd with numbers about as 3 to 2, in either case enough to have ensured a decisive result, the effect of which might well have been to determine the co-operation of Austria in favour of France, and in any case to have modified most profoundly the subsequent course of the war; but it was Jena over again with the parts reversed —no one capable of forming a great resolution.

The cause, he shows, lay in the unfortunate tactical tendencies of the moment. The introduction of the breech-loader had been held as so favourable to the "defensive" that nothing was heard about the occupation of "good positions." In one moment the whole spirit of the Napoleonic epoch died away, and all the memoirs on operations, reconnaissances and so forth read like belated transcripts from the days of Turenne. Corps, divisions, even brigades all camped and lay in order of battle, ready to defend their front at a moment's notice, no matter how distant the enemy, and once well settled on the ground, there was a natural disinclination to leave it. Actually the enormous almost three-fold, superiority in range of the Chassepot over the needle-gun and the possession of shrapnel shell in the field batteries promised the French a tremendous advantage if they assumed the initiative. They could choose their own range to suit their time fuses, adjustable to 3,000 and 1,500 metres only, and form their fighting line on the old Napoleonic method at such a distance that whilst holding the enemy under most effective fire, say, at 800 yards, they would have been beyond the reach of an effective reply from the Prussians, whose weapon was only sighted to about 600. As in case of attack Moltke had prescribed the occupation of entrenched positions, the issue of such a fight in the early stages of the war could hardly be doubtful, they could have held their opponents under fire as long as they deemed suitable, and only gone in to attack when the requisite fire superiority had been sufficiently obtained. The superiority of the Prussian artillery would have been largely discounted, for they would have had to form their lines under shrapnel fire—a very different matter from coming up under cover and choosing one's own distance and opportunity for opening. It is difficult to estimate the full consequences which would have resulted from an adherence to the old methods; in the long run, German numbers and organisation would certainly have told, but it might have taken them as many years as it actually took months to destroy the Imperial Army.

The portions of the work now before us only go down to the night of the 4th of August; they are of quite absorbing interest, especially in the details of the fighting at Weissenburg, and we look forward with the keenest pleasure to a further instalment.

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